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Technology, History and Pedagogy: Exploring the Distance between Theory and Practice.

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Technology, History and Pedagogy: Exploring the Distance between Theory and Practice.

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Abstract

This thesis examines the apparent paradox between the introduction of new technology into the classroom and studies that have reported that they have had little effect on learning (Cuban, 1986; 2001; 2003; Selwyn, 2014; 2015; 2016a; 2016b). If this is the case, then it raises the question of why.

Central to this thesis is the apparent distance between expectations of technology in teaching and learning and the current practices of teachers and young people. The context for this enquiry is a special school in the UK that is designated as an IT Showcase School.

Following an examination of the literature, the thesis provides an account of the history of the Gutenberg press as a means of identifying how technology might change social and educational practices. Given the length of time it takes for major technological change to take effect, any study of the impact of new technology needs to be placed in a historical context. Of particular note, is that with respect to the Church the role of both the priesthood and the laity changed as a result of the Gutenberg press. The dissemination of knowledge through the books produced by the technology of the Press enabled the traditional authority of the Church to be challenged. This analysis is used as a guide to examining the current social and educational practices of young people and teachers to try to elicit whether any parallels can be drawn between the history of the Gutenberg and current uses of new technology.

The historical analysis lays the ground for a study of the views of teachers and students to assess the ways new technology is being used by them. The views of young people and teachers are garnered through focus groups, a collaborative IT tool, and open-ended questionnaires.

It is found that the traditional role of the teacher is being challenged as are the ways young people communicate outside the classroom. The teachers raised a series of issues that were barriers to the innovative use of technology, while the students drew a strong distinction between the uses of technology outside school and inside, which may also deter innovative technologies for learning.

This thesis concludes with a set of practical implications for how we might improve the incorporation of technology in the learning process, more effectively.

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Chapter 1. Introduction

This thesis examines the apparent paradox between the introduction of new technology into the classroom and studies, which have reported that they have had little effect on learning (Cuban, 1986; 2001; 2003; Selwyn, 2014; 2015; 2016a; 2016b). If this is the case, then it raises the question of why. This question is central to this thesis.

One clue as to how we might be able to address this question comes from the following example from my own school, which is a school for those with special needs. This school was recognised nationally as a centre of technological expertise with a commitment to use technology in ways to enhance teaching and learning. Whilst this research has been conducted in a special school, it does not focus on 'disability'. The research shows that the students in this study have a sophisticated understanding of the use of technology in communicating with others. It is possible, therefore, that we may be able to make the inference that the views of their mainstream peers would not be dissimilar.

Previous technological initiatives at the school included the introduction of augmentative devices, which empowered young people with Special Educational Needs and Disabilities (SEND) with increased opportunities to engage with their learning. Such devices included adapted switches for choice-making, a suite of iPads across the whole school including one for every teacher and then latterly the transition to becoming recognised as a 'Showcase School' for a leading international IT company, which introduced a range of tools, and software for learning. The intention was to become exemplary in using technology to enhance pedagogy, yet on reflection, this approach was problematic, in ways this thesis attempts to articulate.

Throughout the move to increase and develop our use of digital technology in the classroom, we invested in tablet devices and were beginning to use these in classroom practice, but soon realised that little had changed in terms of teaching and learning. Rather than use technology in new ways, as had been assumed by the staff, iPads were used to '*research*' or access Google and other search engines, and the camera functions were used to take pictures of students participating in activities (much the same as a standard camera would). From a whole school perspective, the introduction of interactive whiteboards to all classrooms resulted in them being used to show learning outcomes or tasks visually through the projection of documents, much like an Overhead Projector.

The teachers continued to teach from the front of the room, using the technology to transmit the information to the learners through tools like Apple TV or interactive whiteboards. The use of such devices to screen videos or learning materials resulted in learners returning to being seated in a passive formation, as recipients. An assumed change in practice was unrealised; this thesis seeks greater understanding as to why.

In contrast to this scenario, I was working during this time, with a young autistic student with very little spontaneous language who uses a wheelchair and frame for support. She was very passive, and little motivated or engaged her. As a result, her experiences of education were primarily 'sensory and experiential' insomuch as they often happened around her and 'to' her. There was very little eye contact or unprompted activity exhibited by this student and the majority of her time within school (and outside) was guided by prompts. Whether verbal, visual or physical, much of her interactions with others, her learning and the world around her, were managed by adults.

I recall the time that she was first given an iPad and the sudden shift in her demeanour, physicality and spontaneous movement. She, very quickly, became animated and through trial and error could figure out that 'swiping' opened the device. She proceeded to recognise that touching icons on the screen opened various applications. Within minutes, she had 'learned' to navigate to a TV app and could press on a 'link' to a programme that began, causing her to sing and 'dance' in her wheelchair. This process, whilst simple, underpins the significance of how technology, potentially, can change the ways that young people access learning in school. Equally, this mirrors the young person's world outside of school and forces us to question whether technology has the capacity to mitigate the distance between these two previously separate worlds.

In seeking to address the question of why technology has not led to improvements in learning, the focus of this investigation is on the relationship between the use of technology in schools and how it is used by young people outside school. The possibility that the use of particular technologies, such as the iPad, the smart phone and the internet may be able to close the distance between students' everyday lives both in and outside of school offers hope for the learning of many students, as it did for the person in the wheelchair. Why has this hope not been realised? The anecdote above provides an indication; namely, that schools have used such technology to reproduce existing practices, rather than adjusting

practice to the outside world that students inhabit. By eliciting the motivation and practices of young people outside of school, the question remains as to whether these can be imported into education and back out again. This also requires us to appreciate how teachers and young people use technology within the school in order to understand the gap between the use of technology within and without school.

The idea of adjusting to the practices of young people outside school is more complicated than may first appear. For example, what we see when passing down the road are students using their thumbs at great speed to communicate with friends. This does not look like a radically different kind of practice from those that existed in peer interactions before the advent of the smart phone. However, if we are, as Freeman and Louçã (2001) suggest in the midst of a new technological revolution, then it pays to stand back and take an account of the history of technological innovations that have fundamentally changed the world. In this thesis, I will seek a perspective through the lens of the advent of the Gutenberg press to see how far-reaching this innovation was in changing social practices and the way people interacted with each other, and the forms of learning that it created. Can we discern analogous changes as a result of the new technologies available to students? If so what are the implications for pedagogy and learning?

It may seem that such a long historical overview also takes us some way from the daily questions about student learning in school. It can be argued that such a perspective is helpful, as a heuristic, in understanding the possibilities of these new technologies in the development of learning. In the debates about the role of technology in learning the key researchers in this area also use historical analysis to provide perspective on our present context (Selwyn, 2014; 2015; 2016a; 2016b; Cuban, 1986; 2003, Moodie, 2016).

Thesis Structure

Following the Introduction in Chapter 1, the subsequent chapters are summarised as follows:

Chapter 2: The Literature Review

In chapter 2, I review the literature on this topic, paying particular attention to how both technology and learning are understood. The work of leading researchers in this area will be critically reviewed. In particular, the work of Selwyn (2014; 2015; 2016a; 2016b), Cuban

(1986; 2003) and Cuban and Jandrić (2015) form the basis for this review. In examining this literature, a question that is raised is whether pedagogy is governed by policies that seek to measure learning by test results. In turn, this prompts a reflection on whether we have not made the anticipated progress in the use of technology because of the forms of mandated pedagogy that exists in countries like England and the United States, which, arguably, may deter the creative use of new technologies. In effect, this is a hypothesis as to why we have not made the expected progress in the use of technology in learning. And while it is not the only hypothesis to be considered, it does serve to emphasise the point that technology is always related to particular social formations, it is not a *deus ex machina.* However, a note of caution is also needed because there may be many hypotheses that could explain why technology is not being used to its full pedagogical potential.

Chapter 3 Methodology

In Chapter 3, I turn to the four methodologies that I use in this thesis. To start there is an historical analysis of the impact of the Gutenberg press on changing social practices, such as the way people interact with each other and the changing nature of their interactions with the key authority at the time, the church. This is guided by the work of Lievrouw and Livingstone (2002) who propose a mechanism for understanding the impact of technology on social practices. The changes identified as a result of the Gutenberg press are then considered in the context of current changes. The latter are explored through the views of young people and teachers by focus groups, a collaborative IT tool and questionnaires respectively. It is noteworthy that the literature referred to in Chapter 2 has not studied the views of young people, yet their views may have a significant impact on the way technology is used in learning.

Chapter 4 Historical Analysis of the Gutenberg Press

Chapter 4 will undertake the historical investigation of the Gutenberg press and its implications for, and impact on, social practices for knowledge production and sharing by drawing on Lievrouw and Livingstone's (2002) classifications. What we can learn from this example will be applied to the next step in the enquiry in Chapter 5.

Chapter 5, Technology and the 21st Century

This chapter provides the links between the theory, literature and history to the present. It highlights the similarities and differences between the effects on practice created by the advent of the Gutenberg press and the current IT revolution. It concludes by asking whether there are parallels that can guide the empirical analysis of the data from teachers and students.

Chapter 6. Empirical Testing of Key Themes.

Following the classifications set out by Lievrouw and Livingstone (2002), this section aims to test whether the themes identified through the narrative analysis of the Gutenberg press and the parallels offered by 21st century comparisons are evident in the responses of young people and teachers currently engaged in teaching and learning.

Chapter 7. Practical Application of Key findings

This chapter presents a reflection of the extent to which changes in either pedagogy or practice may be brought about by the use of new technology. It concludes with some practical examples that can be fostered in teaching, and classroom-based learning.

Research Questions

In the light of the above structure, the thesis will seek to address the following research questions:

- What can we learn from the historical example of the Gutenberg press about changes in practices and dispositions that can be used as a guide to further investigation of the uses of new technologies to enhance learning?
- In what ways do teachers and students use technology in learning?
- What do teachers and students tell us about their use of new technology inside and outside school? Are their views helpful in helping us understand how technology can be employed to better enable learning?
- Is there a gap between existing pedagogical practices and what we might expect of technology in enhancing student learning and practice?
- Finally, can these explanations lead to enhanced learning?

Chapter 2 Literature Review

The Literature Review focuses on three broad but related perspectives: the first being technology. In setting out the argument that we are now in the midst of a technological revolution, the first task is to ascertain a framework for understanding the relationship between people, their learning and how technology in the wider sense, can influence it.

Focus then moves to the literature in which there is agreement that technology is not being best exploited for pedagogical purposes. For this reason, a detailed analysis of the key positions that have been developed is undertaken, since they provide the basis for a framework for understanding why technology has not been fully utilised. In part, through the analyses provided by Cuban (1986; 2003), we can see there are different dimensions to the problem such that the question of the use of technology needs to be understood not only at the level of the classroom but also in terms of the policies that structure pedagogical practice. For this reason, consideration is given to how current policy decisions may inhibit technological progress. As indicated previously, this can be seen as a hypothesis about testing but more fruitfully it can be seen also as a heuristic for understanding the complexities within the question being addressed. This is followed by a discussion of how we can best make use of the historical example of the Gutenberg press to understand the current context. The point being that an historical perspective may give us a better understanding, since if we are in the middle of such major technological changes, gaining a sense of our bearings is difficult. In particular, this historical perspective may help to explain why it may be that the potential for the use of technology is not being exploited. A bridge is built from the historical precedent to the analysis of the data elicited from teachers and students in this study.

What do We Mean by Technology?

This section draws on the arguments made by Bell (1974) to articulate the interaction between technology and society in his identification of the rise of *intellectual, social* and *machine* technologies (ibid., p.29). He offers these terms as a way of understanding the impact of technology on society. He summarises these three terms collectively as '*(1) the increasing importance of 'service' industries (as opposed to primary production) in the economic order; (2) the increasing substitution of 'knowledge'—especially 'theoretical'*

knowledge—for property as the basis of the social order; (3) a resulting increasing reliance in the political order on technical expertise for the definition of, if not the actual resolution of, social and political problems; and (4) a consequent increase in the rationalisation of social and political life, embodied most clearly in social planning of various kinds.' (ibid., p.27).

Distinguishing between conceptual understandings of the impact of the technology on social practice is useful as it separates the physical tool, from the routines or systems by which it operates. In highlighting the three-part distinction, we begin to see how the nature of technology depends on the interplay between people and their practices and as such, cannot be explored independently. The distinctive nature of Bell's (1974) description for *intellectual technology* as an overarching conceptual '*…effort to define rational action and to identify means of achieving it.*' (ibid., p.30) is useful as it acknowledges that all actions and situations involve constraints and it is the variable nature of these constraints that is crucial to understanding the use of technology.

The distinction between the physical objects of technology and their application has now become standard for how technology is considered and employed within the literature. Lievrouw and Livingstone's (2002) account of technology is similar to that of Bell (1974), although for them the idea of the intellectual is implicit; like Bell (1974) they highlight how technology should be considered from more than one aspect. They propose the following three aspects best define technology's social integration:

> *'Artefacts and devices: that is, technology itself, how it is designed and made.*
>
> *Activities and Practices: that is, what people do with technologies (including issues of interaction, organizing, identity and cultural practices);*
>
> *Context: that is, social arrangements and organisational forms that surround the use of technologies (including institutions, social structures and cultures).'*
>
> (Lievrouw and Livingstone, 2002, p.8).

Consolidating what is meant by technology within this thesis, by referring to artefacts, activities and practices, and contexts allows us to then consider the application and impact on teaching and learning.

The first aspect concerns the physical and practical qualities of the technological tool such as connectivity or applications and the software available to it. The second concerns how it is brought into existing practice and the way it is used in various social interactions, such as teaching and learning. The last aspect focuses on the guiding conditions for its use, such as, in educational terms, educational policy, assessment protocols and curricula construction as a result of the changing activities and practices. Establishing the context and intention of this first section allows for a subsequent discussion of how technology is used in the classroom, and the reasons for doing so.

Technological Change and Education

Freeman and Louçã (2001) argue the only way to understand the systemic and pervasive role of new technology is to grasp the qualitative changes to social practices. This, they argue, will lead to better understanding of how the world has changed; people's understanding of the world and the opportunities new technology affords.

Given the length of time it takes for key technological changes to take effect, it is clear that any study of the impact of new technology needs to be placed in an historical context. The major researchers in this area, all refer to historical examples (Cuban, 1986; 2001; 2003; Selwyn, 2014). Moodie (2016) refers explicitly to the Gutenberg press in his historical analysis, however, his focus is on how it impacted on pedagogy and knowledge. In contrast, we use the introduction of the Gutenberg press to articulate ways in which it established the technological conditions that transformed how people made sense of their world. In particular, how it changed authority relations, and developed new roles for clergy, teachers and the general populace because it enabled a transformation in the way people could access information, and knowledge. Such a focus should provide a better understanding of the current situation.

The Debate over the Introduction of Technology in Education

Traditionally, there is a distinction between what is learned in education in the formal sense and that, which is experienced and learned outside of the classroom. By opening a discussion about the shifting social world outside of education because of technology, the question as to whether there have been similar impacts within education arises. The following section outlines the four different positions taken by Cuban (1986; 2003) that underpin his arguments. The first position is political and questions why technology is seen as the basis for educational effectiveness and is premised on coalitions between policymakers and manufacturers. The second is a view as to why education is *not* like industry, and therefore, technology cannot simply be applied in the same way; the third elaborates the challenges of applying technology to education; combined, these arguments become powerful. The final position taken by Cuban (1986; 2003) is about power and pedagogy and examines how teachers are expected to interact with technology, and explores themes such as control, assessment, and grading, which is where the question of a regime of repeated testing enters.

Cuban, Computers and Classrooms

Cuban (1986) postulates three sets of interrelated features that justify and explain how optimistic expectations for technology can be challenging. Defining the justifications into three broader themes (*Practical, Innovation and System Issues*) allows him to demonstrate that the relationship between technology, students and their learning is much wider than to simply enhance or refine existing practice by employing technology. Such affirmation resonates with the personal observations set out at the start of this thesis. These themes also open up a space for discussions about technology, to explore further questions and allows us to move beyond the present discussion in the literature.

Cuban (1986; 2003) devoted a large part of his career to exploring the relationship between technology and classroom practice. In attempting to understand this relationship, he considers the wider political and social agenda surrounding the inception and development of technology before focusing on the habits and practices of teachers.

Central to Cuban's (2003) position that computers in the classroom are oversold and underused, is a critique of the commonly held assumptions about technology. He takes the

view that much of the hype about technology is down to an implicit 'coalition' between manufacturers, policy makers and corporate business.

He argues that this coalition has advanced the view that technology will attain the following goals:

> *'1. Make schools more efficient and productive that they currently are.*
>
> *2. Transform teaching and learning into an engaging and active process connected to real life.*
>
> *3. Prepare the current generation of young people for the future workplace.'* (Cuban, 2004, pp.13-15).

Since the 1920s, Cuban (1986) argues, those responsible for educational practices have been charged with ensuring educational effectiveness to which this *coalition of interests* has proposed technology as the 'answer' to the problem of effectiveness. Implicit in this position, he argues, are two assumptions. The first being that 'school reform' in its broadest sense, is constantly necessary to ensure that policy and practice are the *best* they can be. Thus, an ever-improving culture is accepted. Further, those operations outside of education such as industry and business *should* be emulated as best practice which (1). Infers a relationship between that which happens outside education and that within. Here Cuban (2016) critically assesses the claim that education can learn from business, which is assumed both effective and efficient. (2). Consequently, education and business (previously two distinct spheres) now need greater parity and, (3). Greater effectiveness and efficiency in education will ensue in ways similar to technological advances, industrialisation and the automation of business. In criticising this view, Cuban (1986) attempts to articulate the reasons for the distance between the expectations placed on technology and its uptake in teaching and learning.

To underpin his argument, he contends that education is unlike industry because it has necessarily conflicting priorities, which resemble a *'…crucible where conflicting cultural, community, and organizational imperatives mix…'* (Cuban, 2003, p.2). There are those people in both industry and in educational policy roles, Cuban (2003) argues, charged with responsibility for overseeing cost, efficiency and administration. Their priorities might differ from those charged with transmitting and passing on knowledge to coming generations and

developing and nurturing students. However, he argues that technology is now being used once again to mirror what is happening in industry.

Largely omitted from the discussion, Cuban (1986) argues, are the questions as to whether technology *should* be introduced into education, and if so, then if what happens outside the classroom is relevant to education. He is keen to acknowledge that the responsibility of *'…foundation executives, educational administrators, and wholesalers who saw solutions to school problems in swift technological advances'* (Cuban, 1986, p.5) are in contrast to the views of those directly required to teach.

The later work of Cuban and Jandrić (2015), discusses further ways in which schooling is becoming more complex and for which technology is again seen as an 'answer' by policy makers and technology industry salespersons. This discussion introduces the concept of '*educationalizing*' (ibid., p.434) as a way to explain the transfer of societal and structural difficulties such as obesity or alcohol consumption to the remit of schooling. In doing so, Cuban and Jandrić (2015), identify two shifts. The first, they argue, is that blame moves to the children, young people and teachers. Secondly, as the world is increasingly technologized, it is assumed that the use of technological devices will help to address such issues.

The context for much of Cuban's (1986) argument is to consider why the use and engagement of technology within education has been relatively slow. This he approaches with the three themes outlined at the start of this section.

Practical Considerations

The *practical* considerations concern the challenges associated with physical access to hard/software and whether these are adequate for purpose. To consider whether if it is the teaching that adapts to include technology or if technology can adapt to teaching practice soon raise issues such as obsolescence, adequacy, limited signal access, and cost. These considerations are premised on a misalignment between the requirements of the pedagogical task and the technology provided. The distance between supply and demand is central to the second set of reasons Cuban (1986) highlights.

Innovation- Challenges with Adoption, Implementation and Purpose

Challenges for *implementation* and *innovation* are driven by disparity between how technology is chosen, adopted and applied. This position, Cuban (1986) suggests, is related to corporate and financial considerations and is usually a product of mandated pedagogy. This, he argues, enforces a top-down bureaucratic approach to technology use. This position, again further articulates a conflict between those responsible for *overseeing* education and those responsible for its *delivery.* This second category of understanding technological innovation is premised on organisations using local knowledge and considering their specific circumstances in terms of introducing technology. There is no generic process for innovation and as such, it is dependent on the specific context of each organisation. Returning to the intricacies of the relationship between technology and education, Cuban (1986) sets out the third theme as a way of moving the conversation to the specifics of governance and teaching practice.

System Issues- Challenges with Associated Processes of Routines in Practice

System Issues are a product of the problematic adoption or use of technology, Cuban (1986) suggests. They manifest in enforced compliance and an overly dehumanised and mechanistic view of education and are premised by the mandate for public schooling being to '*…get a batch of students compelled to attend school to absorb certain knowledge and values while maintaining orderliness.'* (ibid., p.57).

Cuban argues that education policy makers are concerned to provide uniformity to an education system, which would otherwise be determined by the idiosyncrasies of individual teachers. Examples of the attempt to provide standardisation, and arguably order, include the use of a prescribed curriculum, standard testing, uniforms, enforced interactions and the fact that education is compulsory. Under these conditions, Cuban (1986) argues, it is unsurprising that any additional demands, such as the expected incorporation of technology, can seem challenging because it is yet another demand on teachers.

Having set out the prevailing conditions for technology in education, Cuban (1986) moves to consider why there is still little uptake within education when viewed from the perspective of the information age suggested by Freeman and Louçã (2001). The '*deep seated conservatism'* (Cuban, 1986, p.59) stems from the beliefs of experienced practitioners in the

field that technology is not necessary for good teaching. When new teachers enter the profession, the prevailing conditions are perpetuated by a reaffirmation that mechanical devices are hindering classroom practices and may also challenge the role of the teacher. This conversation leads to reinforced stability rather than change. Such perspectives strengthen the assumption that the expertise of the role of teacher is compromised *by* technology.

Central to a perspective such as that identified above are issues of control and power. Outside school, the impact of technology in terms of its adoption and use is much more prominent than that in classrooms. How then, can there be such a difference between *how* technology is used outside of the classroom when compared to within? The tension arises from attempting to understand how and what technology does, or indeed is perceived to do *to* teaching and learning. The themes that emerge from the literature focus on the complexities, skill and art of teaching that warrant the employment of technological devices unthinkable (Cuban, 1986).

Moving away from the systematic and practical issues Cuban (1986) cites Hoban (1977) who suggests that teaching is a ritual-like art that takes time to refine. Whilst the maxim '*if it ain't broken, don't fix it'* might be attributed to this discussion, an overdue clarification of where we can look to better understand *what* and *how* technology might compromise or change the *art* of teaching is needed.

There appears a disconnection or inconsistency between that which happens in everyday life regarding technology, and that which occurs in the classroom. The inferred relationship between two distinct spaces is interesting because there appear conflicting perspectives. In one sense, technology is seen to improve efficiency in its integration in everyday life. Yet, technology's use in the classroom remains largely over sold and under used. Often cited as a defence, is the nature of the relationships between teachers and students in teaching. The teaching process we are cautioned, must never be compromised by technologies that '*…either displace, interrupt or minimize the relationship between teacher and child.'* (Cuban, 1986, p.61).

How Can We Use What We Know of Technology?

Cuban and Jandrić (2015, p.428) advocate that by re-walking a '*historical path*' we will better understand the current context of innovation and the characteristics of the conditions in which technology is being examined. This theme is taken up later in the thesis by way of an exploration as to the social changes brought about by the Gutenberg press. This approach is similar to that of Moodie (2016) who uses history to chart and predict the changing interplay between technology and social practice.

Prior to looking for historical precedents that might help us to understand the present role of technology, I consider Selwyn's positions (2014; 2015; 2016a; 2016b). He extends the value of looking at history in terms of *what* and *how* technology *has* and *may* change educational practice. The central argument that Selwyn (2015) makes is two-fold; from a political perspective, he follows Cuban (1986) in discussing the role of technology in terms of suppliers, manufacturers and Government as policymakers. Here he stresses the exaggerated expectations of technology on educational practice and the empirical evidence to support it. He then asks whether the use of new technology, allows us to reject previously entrenched boundaries for learning and to reconsider '*…what counts as knowledge, skills and learning.'* (Selwyn, 2015, p2).

The following sections discuss his position with respect to these observations.

Expectations of Technology; Lessons from Selwyn.

Selwyn argues that there remains a distance between understanding the potential benefits offered by technology and its uptake in certain contexts. His (2014; 2015) work offers a provocative discussion on how we can rescue the opportunities afforded by technology through a systematic (re)consideration of its potential. Selwyn (2016a; 2016b) asks if technology is 'good' for education and if so, why? He then moves to a discussion that considers if appropriate questions are being asked of technology and if not, whether our expectations are misaligned with current practice.

Better questions, are required, argues Selwyn (2016a) that maintain an objective scepticism as to the role of technology within education and without. Selwyn (2014) is keen to point out that without acknowledgement of the underpinning (and often wider) beliefs around what constitutes a 'good' education, technology is all too often accepted as a '*pedagogic*

corrective' (p.33) and a means to qualify certain practices. This argument is, also, present in the work of Cuban (1986).

Broadening our contexts for understanding how technology is used in different spaces is significant as Bulfin et al., (2016) argue. Being able to articulate the distinction between that which occurs outside of the classroom and how technology is used within helps in reminding us that different contexts might require different practices and expectations. Placing discussions of technology in education into a wider social context allows Selwyn (2016a; 2016b) to reframe the relationship between education and technology as one that is about carrying out our '*many aspects of everyday life*' (Selwyn, 2016a, p.1). From this perspective, he suggests the potential for technology in transforming the way we both generate and communicate knowledge, allows us to ask questions about the locations in which learning and understanding take place. As with Cuban (1986), he is keen to highlight the often-implicit foundations of technology as initiatives that are concerned with politics, Government, supply and demand. These, Selwyn argues, should not be overlooked when discussing issues of what '*counts as knowledge, skills and learning*'. (Selwyn, 2016a, p.2).

The demarcation between the use of technology at home and school is arguably diminished by advances such as wireless connectivity, 4G telephone signals, smart tech. and portability (Luckin et al., 2012). Arising from this position is the argument that learning opportunities are now concerned with being able to acknowledge and navigate the series of '*…boundary crossings* and *social spaces*…' (ibid., p.241) such as home, school, social and peer groups, in class, and in the street. Selwyn (2015) further considers formal and informal processes within learning to distinguish between how and where learning takes place. This mechanism is used to demonstrate that whilst learning happens in a formal sense within institutions, there are wider considerations for learning throughout our life-course. What does this shift mean for teaching and learning? How do we understand the ways that technology is being used outside of the classroom to better enhance learning opportunities?

Selwyn (2016a) again reminds us that the wrong questions beget the wrong answers and as such, our understanding of the intricacies of technology use is flawed. One way to address this conflict is to make two moves. The first being to consider how school is defined in technological terms, and then to ask, how does technology change the role and behaviour of the learner or teacher?

Returning to our original questions, arising from the observations provided at the start of this section, we remind ourselves that this is a discussion about the relationship between technology, and how we *'…'do' education, as well as how education is 'done' to us.*' (Selwyn, 2016a, p.2). Selwyn reinforces the view that for reasons to be investigated, schools may be a conservative force when it comes to technology. He argues that there appears to be scant, evidence to suggest that revolutionary thinking or practice has resulted from technological innovation. To this end, he suggests that *'…the essence of education has remained the same: punctuated by an entrenched 'grammar' of doing things, that reinforces the notion of the expert 'teacher' and the regulation of time, space and place, alongside the routines of curriculum and pedagogy, and the rituals of assessment and credentializing*.' (Selwyn, 2016a, p.19).

Quite how these changes might occur and the extent to which we might anticipate a digital revolution is then raised by Selwyn (2016b) as he challenges the hyperbole surrounding educational uses of digital technology.

By acknowledging the use of the language that has come to be applied to the field of digital educational technology, Selwyn (2016b) suggests it is '*opaque, obtuse and self-serving…*' (ibid., p.438) and indicative of outside influences. Interestingly, for this thesis, his examination of the relationship between what happens inside the classroom and the political and commercial worlds is significant. The pervasive nature of language emanating from advertising or politics is too often found being used in educational parlance. This shifting use of language in differing fields may impede any meaningful understanding of the educational potentials afforded by technology. Whether these influences on education filter down to teachers is to be investigated.

What needs greater attention, prior to moving to the historical exploration and subsequent empirical analysis, is a justification of the social conflict, political context and the varying uses of technology at the individual, institutional and societal level. This is important because we need to understand how the levels of policy and funding impact on the potential use of new technology within the classroom and how this relates to the way it is used by students outside school.

Reviewing the Current Situation.

Here we should stop to consider the role of policy in the apparent lack of innovation and technology use in the current English education system. In clarifying this, through the example of testing regimes we can then understand more fully that which we need to uncover when looking to history.

The Current View of Pedagogy; Testing and Motivation.

In order to clarify why technology may not be useful in improving learning within education, we need to consider certain policies, such as testing which, arguably, is key to current forms of pedagogy. This is achieved by setting out the current testing regime, looking at its inception and the assumptions on which it is premised. Then, by unpacking these positions in the form of a critique of testing we can argue that it may inhibit the use of technology to enhance learning.

Reforming Education

The Education Reform Act was introduced in 1988 as a mechanism to increase standards in schools. Critics argue that its introduction simply '*marketised*' the field of education under the guise of moving responsibility away from Local Education Authorities (LEAs) towards an increasingly standardised system (Reay and Wiliam, 1999). Key to this transition was the introduction of statutory testing for students aged 7, 11, 14, concluding with final examination at 16. Justification for testing is premised on acquiring better information in terms of student progress for teachers and parents. In turn, this allows for more accurate decisions to be made, such as streaming in ability groups, entry to formal external examination and more vitally, aggregate measures of *school performance* (Reay and William, p.344). The decision to provide 'rigour' to a system that will allow for greater understanding of student progress that leads to the potential for better learning outcomes appears fitting. Yet, the wider agenda, which is currently being articulated suggests that the drivers for this change in policy are concerned with being able to hold schools to account against nationally published targets, rather than enhancing learning opportunities.

The Current Picture; or a Case of History Repeating Itself.

As has been suggested by Cuban (1986; 2003) and Selwyn (2014; 2015; 2016a; 2016b), policy makers' intentions are often premised on certain implicit assumptions. One of these being the *State Theory of Learning* developed in Lauder et.al. (2012) that articulates the relationship between policy and assessment. This theory posits that high-stakes testing, such as that described above, is employed to signal performance and progress to external stakeholders. The implicit assumption that underpins such a theory, is that repeatedly testing young people will subsequently result in the acquisition of the required knowledge and skill.

A History of Numbers: The Story of High-Stakes Testing Itself

The following section concerns the underlying assumptions of high-stakes testing by elaborating on the work of Torrance (2012) who articulates the risks associated with policy decisions concerning assessment, such as that employed by high-stakes testing.

Central to this critique is the assumed acceptance of learner outcomes and achievement as proxies for efficiency and effectiveness. If results are improving, then the quality of the learners' educational experience is too. This is pertinent to this thesis as it is argued that there is a misalignment between the assumption of that which is taught and that which is learned. Previous attention to a reformed tripartite education system simply furthers this notion of selectivity and preclusion from learning.

The success or failure of high stakes testing will rest on student motivation. The social psychologist Carr (2016), examines the way that educational policy relates to the motivation for learning. He offers a critical perspective that draws on educational psychology, social justice and the belief that '*…education should authentically care for children and young people, striving to nurture, value and celebrate them for who they are, looking beyond their academic preparation and potential as knowledge workers, focussing upon their social, emotional, psychological, physical and spiritual needs as children and individuals….to …lead personally meaningful lives.'* (ibid., p.1).

This perspective is useful as it recognises the individual motivations, the heterogeneous nature of young people and the differing opportunities that structure how people make sense of themselves and the world around them.

Carr (2016) seeks to highlight an important discussion that current educational trends, it is argued, are a significant threat to good quality classroom practices, which he frames with his theory of motivation and educational success. The key to his argument is that such testing, at best offers extrinsic motivation, whereas the motivation to learn rests on the development of intrinsic motivation. It should be recalled that students receive no feedback from the many examinations, such as Statutory Assessment Tests (SATs), rather they are as learners, collateral to the judgments made about teacher and school success.

Carr (2016) argues that standardisation and testing do little to reflect the complexity of learning and reduces it to simply '*teaching to the test*' (ibid., p. 138). This, he contends, does not allow students to become best equipped to understand their world and encourage the development of the necessary skills and knowledge, rather than simply help them pass exams.

The measure of high-stakes testing fails to account for achievement having currency outside of education. The perception that schools are '*…ripened sites for social control, indoctrination and overt surveillance'* (Carr, 2016, p.27) does little to illustrate the success as anything other than rhetoric. Further, that which constitutes success or excellence is prescribed by policy makers and therefore nothing other than the result of a pervasive control system. Scepticism such as this is articulated by both Selwyn (2014) and Cuban (1986; 2003).

The case of testing has been discussed at some length because it demonstrates Cuban's (1986) thesis that the under-utilisation of technology can be understood at many levels within education. The research in this thesis will focus on classrooms, teachers and students, however it is important to recognise that our findings will have to be placed within a wider context, such as that of testing, which due to the pressure, as Carr (2016) suggests, to teach to the test, may inhibit the innovatory use of technology.

The Search for Historical Precedents to Make Sense of the Present

The last theme we explore is that of using history to better understand how social change may eventuate.

Innis (1950) acknowledged that following technological innovation, such as the printing press or rail network, previously separate communities began to increase communication within newly created contexts for interaction. This link between contexts is indicative of the social change that is brought about through technology. The current situation however, illustrates that there is a distance between an assumed revolution or transformation and that which subsequently eventuates.

Selwyn (2016b) suggests that over the last century, there are few historical precedents that support the apparent revolution promised by educational technology. In fact, he argues that '*…education has been largely un-transformed and un-disrupted by successive waves of technological innovation.* (ibid., p.439). Using the themes in the literature regarding the relationship between what happens in the classroom and the world outside, this section will illustrate that the potential for educational technology cannot be solely understood in educational terms. Any attempts to understand the tension between history and the current day requires a broader social understanding. What understanding of the processes by which technology is adapted can we gain if we look further back? Are there any examples of significant technological innovation that led to changing behaviours and social and educational practices?

Both Cuban (1986; 2003) and Selwyn (2016b) refer to the importance of history in understanding the problems they see in the under-utilisation of technology. As Selwyn (2016b) cautions, by not acknowledging the wider historical forces at play, we are at risk of falling foul of Giroux's (2014) *'violence of organized forgetting'* and overlooking the historical and moral contexts of the situation.

Central to arguments regarding technological innovation is the suggestion that traditionally accepted educational practices will be revolutionised. Yet, empirical research, such as that of Cuban (1986) or Selwyn (2016a; 2016b) and revisited by Moodie (2016) suggest that digital technologies, have been *'absorbed into existing practices rather than revolutionising them'* (Moodie, 2016, p.2). Both Selwyn (2016a; 2016b) and Cuban (1986) argue that

technology's potential is evident, but the expectations placed upon it, in practice are misaligned with the '*reality*. The question then remains, what can be done to address this situation and how can we align theory and practice?

Aligning Theory and Practice.

The introduction to the Literature Review argued that we are in an Information Revolution, and as such can anticipate a change in social behaviour. Moodie (2016) offers definitions for the conditions of change as referring '*…to changes in the production, processing, transmission, storage, or control of organized data that have substantial effects outside information management on society, its culture, or economy...*' (ibid., p.3). Illustrating this further, Moodie (2016) contrasts three historical junctures: (1.) The Introduction of the Gutenberg Press, (2). The Scientific Revolution and (3). The Digital Revolution.

Of significance to Moodie (2016) is the recognition that technology alone, cannot bring about substantial change (as was shown in the illustrative case study at the start of this thesis). Equally, technological change does not *de facto* bring about educational reform. Moodie (2016) seeks to better understand the relationship between social change and technology, within the field of education. The complexity of time upon this relationship is significant in this respect, as it allows for the intricacies of technological innovation to be considered as part of wider societal developments. He reminds us that '*The Gutenberg revolution overlaps substantially with the scientific revolution. It is simply not possible to consider changes as candidates for the outcome of one or more revolutions by simply observing the sequence of events…one has to trace the threads in history's fabric without unpicking its weave*' (ibid., p.17).

The inference of a direct relationship between technology and change, in both the classroom and in wider society is, for Moodie (2016) problematic. This position is similarly adopted by both Cuban (1986; 2003) and Selwyn (2015).

Moodie's (2016) approach to the history of these technological revolutions and their consequences is to examine them through the categories of the *Financial, Technological and Physical Resources*, *The Nature and Structure of Knowledge,* and finally, the *Methods Available for Managing Knowledge.* Sequentially, they are then applied and developed

within the three specific historic periods. I will illustrate how Moodie (2016) uses these themes in the case of the Gutenberg press.

He begins with the observation that despite the opportunities for technology in terms of superseding and enhancing teaching practices, little remains changed in terms of current classroom practice. Interestingly, he considers both technology and pedagogy to be insufficiently developed in ways that can truly transform the transmission of disciplinary knowledge.

Acknowledging the significant shifts brought about by the Gutenberg press in terms of social practices, Moodie (2016) contends that in terms of pedagogy these have had little impact, once the innovation of textbooks had been developed.

The nature of knowledge and its transmission in education, Moodie (2016) argues, was premised on the '*… verbal arts of grammar, rhetoric and logic…'* (p.240). Assessment of these skills were by way of oral examination and written tests that required the memorisation and recall of large swathes of expository lectures given by scholars. The final assessment marking the completion of study, was the disputation, which was primarily an academic argument. The scarcity of original manuscripts and written records, were perfectly suited for such a verbal and oral culture of knowledge transmission. Moodie (2016) notes that the '*…main aim was to explain phenomena which were well known, rather than to discover new phenomena which would require further explanation…'* (p.240) the impact of this approach was premised on the '*…scarcity of texts held locally; the difficulty of discovering, locating, and consulting texts held by other libraries; the unreliability of manually copied texts…*' (p.240). The impact of the Gutenberg press and the printed book on this process was significant as it brought about major changes in the dissemination of information and ideas. Examples given by Moodie (2016) of these shifts in practice include the way that the church used the printed book to '*deepen their reach over the penitents and subjects'* (p.240) and the way that the printed book provided alternate ways for people to access religious scripture themselves rather than having to rely on church services.

The significance to education practice, Moodie (2016) argues can be seen in the way that lectures were no longer the sole means of disseminating ideas because of the increasing availability of printed books. Academics began constructing courses from different printed

sources rather than the standard exposition of complete works. The curriculum itself began to be reconstructed to cover a range of differing subjects that themselves began to point to other subjects. It is inferred that the printed book began to bring about associations between information sources and knowledge. However, despite the use of the printed book to disseminate ideas, the lecture has remained a key element in the pedagogical repertoire of higher education, as are the oral skills that are assessed in viva voce examinations. Moodie (2016) notes that the proliferation of subjects, study programmes and courses abound, yet the underlying practices remain unchanged. The conditions for the administration of learning programmes and organisation and access to the courses, he argues, is significantly enhanced as a result of technology. He summarises this suggestion when he states that '*Technology may further change methods of work and social organization, which may in turn change education...this would not be digital technologies improving or enhancing learning directly, but would be an indirect effect of technology on education.'* (ibid., p.244).

Moodie's (2016) analysis of the influence of the Gutenberg press is helpful because it provides a platform for my own analysis, which focuses more on the history of the social impact of the press from which we can draw parallels with today's context.

Conclusion

The use of historical analysis by Cuban (1983; 2001) and Moodie (2016) and the value of using history to think about the possibilities of the future, articulated by Selwyn (2014; 2015; 2016a; 2016b) provide a platform on which to build the following chapters of this thesis.

In chapter 4, I will look at the Gutenberg press to understand how change was initiated by it, within a specific social context. This will then be followed by an analysis of how these changes may be of relevance to understanding the modern context.

The Literature Review as a Guide to the Research

In order to summarise what we have learned from this literature review and the way it may focus the research analysis Figure 1 below is provided to demonstrate a degree of consistency in the findings between Cuban (1986; 2003), Moodie (2016) and Lievrouw and Livingstone (2002).

Cuban (1986) suggests that we need to understand the failure to develop innovative pedagogies through the use of new technology can be understood at different levels. In particular, he focuses on the macro political level where he argues that the popularity of technology is not necessarily concerned with benefits to teachers or learning, but simply that it is premised on successful commercial and business acumen. By this, he infers that technology's abundance and the growth of sales do not necessarily represent a growing influence on what happens in schools. He argues that increased sales as a result of the popularity of technology, are simply representative of strong marketing, the commercialisation of organisations tasked with the promotion and sales of technology and policy makers within schools. He is careful to point out that the *innovation* witnessed by an increased volume of sales has done little to develop pedagogical practice and that the tool or physical artefact does little more than reinforce traditional pedagogical devices. This suggestion can be witnessed in his exploration of how pre-determined bodies of knowledge are transmitted to students. Whether by curriculum via the teacher or using audio devices such as tape recorder or the TV, what remains consistent is the nature of the knowledge and practice.

Cuban's (1986) perspective on knowledge aligns with Moodie (2016) who calls into question the nature and structure of pedagogy resulting from technological innovation. A key claim is that regardless of the tools employed in teaching, the underpinning epistemology of disciplinary knowledge frames the resulting practice. Cuban (1986) discounts the benefits of technology in changing teaching and learning practice. He maintains that the introduction of technology to the classroom further provides new ways to undertake the same tasks. Lievrouw and Livingstone (2002) develop this argument in their cautioning of the way that education is structured around the technology. They take the view that while the use of technology may give the appearance of innovation, little actually changes in practice. Returning to the illustration in the introduction to this thesis, we are reminded of the challenges of simply introducing new technologies to teaching without a detailed understanding of how they might change practice. Whether an encyclopaedia, an internet search or vocabulary list is used to fill out a handout the resulting practice remains unchanged.

The second part of Fig.1 below demonstrates the practical implications of technology such as their physical qualities and capacities. There is much discussion about utility, functionality, bandwidth, connectivity and speed that underpin accounts on the practicality of technology (Wheeler, 2015). The way that technology can reproduce, expedite and supersede human behaviours (such as mathematical calculations or searching complex data sources) are important, yet there remains a tension within education as the majority of assessment opportunities test recall rather than process (Carr, 2016).

The final section of Fig.1 is closer to the foundations of this enquiry. How does evolving technology further change social behaviour and practices, and more specifically, to what extent will those changes enhance progress in teaching and learning opportunities? It is from this question that we attempt to elicit a detailed understanding of the specific changes brought about by technology throughout history and then by drawing out some of the key changes in practice.

Chapters 4 and 5 similarly, are guided by the themes identified by Lievrouw and Livingstone (2002). These act as a basis by which to examine the impact on current practice with regard to contemporary technological innovation. Central to this endeavour is to understand from this historical example, the way practices amongst young people and teachers may have changed or have the potential to change in teaching and learning. Following Fig.1 below, we move to examine Gutenberg's press as one historical technological development. The specific way that Gutenberg's press has brought about change to social practice will allow us to then consider whether the same the similar processes might eventuate in the twenty-first century

The Relationship between the Three Theoretical Perspectives.

	Cuban (1986)	Moodie (2016)	Lievrouw & Livingstone's (2002) cited by Selwyn (2015)
A	***Innovation***- related to challenges with adoption, implementation and purpose.	***Nature***, ***Structure*** and ***Level*** of Knowledge	***Context***: that is, social arrangements and organisational forms that surround the use of technologies (including institutions, social structures and cultures).
Discussion A: These distinctions relate to *uses* that the technology provides, in particular the terms of how and to what purpose the technology is being used. They are also focussed on the way that the knowledge underpinning the use is appropriated to certain spaces and purposes. This is the crux of distinction for everyday and school knowledge in practice and how this is structured by technology.			
B	***Practical***- potential/limitations of the physical technology.	***Financial***, ***Technological*** and ***Physica***l Resources	***Artefacts and Devices***: that is, technology itself, how it is designed and made.
Discussion B: These factors are related to the tangible and practical implications of the technologies. Their physical ramifications such as cost, size, durability, mobility and manoeuvrability or restrictions (connectivity, accessibility and function). These descriptions also account for longevity and obsolescence.			
C	***System Issues***- challenges with the associated processes and routines	***Methods*** Available for ***Managing*** Knowledge	***Activities and Practices***: that is, what people do with technologies (including issues of interaction, organizing, identity and cultural practices).
Discussion C: The above categories relate to the subsequent routines and practice that result from the technologies' capacities and is concerned with establishing what comes to define the social practices that arise from their inception.			

Figure 1The Relationship between Three Theoretical Perspectives

Chapter 3. Methodology

The methodologies within this thesis are qualitative and seek to provide a better understanding of the way that technology can bring about changes in social practices and whether they are relevant to pedagogy. The ideas centre on the literature which posits that there is a question about the benefits assumed for teaching and learning in the development of technology.

Initially, this section begins with a historical analysis of both the fifteenth and twenty-first century regarding technology. Both analyses are informed by Lievrouw and Livingstone (2002) as explored in the literature. The use of Lievrouw and Livingstone's (2002) categories act as a means of comparing historical contexts to see whether there are parallels than can be drawn between them. This is followed by qualitative analysis of teachers and students by means of focus groups, open-ended questionnaires and the use of collaborative online tool. This analysis is informed by the historical insights that are drawn between the technological revolutions. This research is undertaken in a special school sixth form.

The school in which the focus groups, questionnaires and use of collaborative software take place is significant as it is designated as a specialist showcase school by an international IT company. We might assume from this position, that the students and the staff are conversant with technology and its use in teaching and learning. Similarly, if this use of technology is indicative of innovation and cutting-edge practice, then such use in classes with students with special educational needs and disabilities might then be translated across to other schools.

Methodology for the Historical Narrative

The use of historical analysis is an approach that acknowledges the common '*storied form'* in diverse texts, such as that advocated by Riessman (2008). The texts examined point to technology in relation to social practices and changing experiences. The process of using narrative analysis concerns the identification and validation of the narrative selected from such texts. The way that events are selected, organised and connected is significant in this respect. In this account, we focus on the way that technology relates to changing social practices, with particular reference to the impact of the Gutenberg press and the changing relationship between Church and society. It is the teasing out of the narrative that it is

important as narratives do not speak for themselves or have unanalysed merit; they require interpretation when used as data in social research. The historical analysis in this thesis references texts (Febvre and Martin, 1976; Eisenstein, 1980; 1983; McLean, 1972; Steinberg, 1974) that attempt to articulate an understanding of the social conditions of the fifteenth century. In acknowledging the importance of historical analysis, the challenges for research need addressing through a theoretical framework.

The purpose of this section is to examine the way that the introduction of the Gutenberg press revised traditional structures regarding the reproduction of information, its relationship to established forms of knowledge, and the transmission of ideas within specific communities and cultures. Findings emerging from the historical analysis will bring to light examples of changing practices that can be used in subsequent comparisons of the way specific groups and communities use twenty-first century technology.

Having identified the examples within the historical narrative, the second method is an investigation of the way that teachers and young people use technology and the perspectives they have on how these uses might be improved. The basis for the contemporary study is to use the changes in social practiced identified through the historical analysis of the Gutenberg press as hypotheses, on which the questions asked of both the teachers and students are premised.

The Qualitative Research

Sample

The qualitative sample comprises two focus groups with young people between 16-19 years of age and the use of questionnaires with four Post 16 teachers within a specialist educational setting. This setting is a special school for young people with SEND and has been designated a showcase school for innovative use of IT in learning by an international IT company. I am employed by this school as the Assistant Principal. The two groups were selected on the basis of their learning programmes, and to compare a full-time school based group and a trainee group that learned at school with workplace experience. It was hoped that this selection would provide contrasting data, in that the two groups may access and use new technology in different ways, according to their respective programmes.

The first focus group comprises eight students between 16-19 years of age, four males and four females. The students are full time on a Traineeship Programme. The second focus group comprises seven students made up of two females and five males, between the ages of 16-19. These students are full time on a Study Programme based in the Sixth Form and they undertake solely classroom based activities. Their subjects include Functional Skills classes in maths and English and then a selection of subjects that are encouraged to develop their independence skills. These include, IT, enterprise, healthy living, exercise, personal, social and health education (PSHE), cooking and travel skills.

Since these were contrasting cohorts, we might expect differences in the way teachers employ technology. According to the argument concerning testing (Carr, 2016), we might expect higher level teachers to be more inhibited than those who taught the group that was engaging in work experience and who, possibly, had greater freedom to innovate with respect to pedagogy.

In both focus groups and the follow up OneNote activity, the students are considered in the lower part of the tail of test achievement. The focus will be on these students because we may assume that they will not have the advantages of cultural and social capital (Bourdieu, 1986), which when linked to these new technologies may offer a different view of how

these technologies are used to advantage in learning by students from professional middle-class families.

Four sixth form teachers volunteered to take part in this study. The four teachers are referred to in the study as teachers, A, B, C and D. The profile of each is as follows and is offered as a way of capturing a wide range of ages, experience and perspectives.

- Teacher A is a female and in her mid-forties. She has 20 plus years teaching and has worked across all key stages in both mainstream and special education.
- Teacher B is female and in her mid-thirties and new to special education with about 10 years previous mainstream teaching.
- Teacher C is male, in his early fifties, and has 5 years' teaching experience in SEN but previously has 20 plus years mainstream experience.
- Teacher D is a Newly Qualified teacher (NQT), male in his mid-twenties and is new to teaching.

The teachers' uses of technology and their views on its impact to their practices (both within the class and without) are the result of semi-structured and open-ended questionnaires. This method is limited in capturing a more detailed understanding of the teachers' use of technology: the justification and challenges associated with capturing the views of teachers are discussed briefly in the following section. This is then expanded more fully in the later section concerning my positionality.

The use of any research method will entail navigating its respective advantages and disadvantages. The design and collection processes have considerable bearing on the quality and quantity of the data available as a result of the questionnaire. At the early stages of the research, the views of teachers within the study were essential to capturing the centrality of how technology *was* (or potentially *was not*) being used in the classroom.

The teachers identified to take part in the study were resistant to being interviewed or taking part in a focus group. The emergence and capture of counterfactual perspectives here was important to the teachers' reflections on their uses of technology in the classroom. The opportunity to engage in a research process that potentially articulated the limits of technological integration in pedagogy appeared problematic. The teachers were reluctant to share their perspectives through a face-to-face method, but were keen to

pursue alternatives. The nature of using a questionnaire in this situation allowed sensitive information to be captured and importantly, fulfilled the teachers' consensual engagement in the process. Tourangeau et al. (2000) capture the significance of the problem of employing research methods with which subjects will be comfortable, although it may not be the best research method in an ideal world.

The overarching concern for the teachers was that their employer and by extension myself as both researcher and line manager, had presupposed perspectives on *how* technology *should* be used in their practice. In engaging with a focus group or interview, the teachers were concerned that their responses could identify publicly shortcomings in their practice, which would potentially impact on their professional reputations. The agreement from the teachers was that they would complete a questionnaire, but wanted to remain anonymous, provided that their responses did not then subsequently impact on the professional role within the school. This is a challenge for the nature of such research and is further explored later.

The use of an open-ended questionnaire, allowed the teachers to remain anonymous, to some extent, and to still contribute to a discussion concerning their pedagogical practice. The advantage of this method was that I was able to capture sensitive or personal reflections, without the commitment of engaging in a face-to-face discussion, as would occur in interviews. They also had the option of taking their time to respond and to edit or reflect on their answers prior to them being presented. This proved significant and will be acknowledged in the analysis and is also is discussed in the section on positionality, as this is central to the methodology. The potential to be 'caught off guard' or 'put on the spot' in a face-to-face interview was too much of a concern for the teachers.

Methodology for the use of Focus Groups

Focus Groups are used to identify the way that young people use technology in their social practices and explore how technology is used in their everyday lives and in more formal learning. The responses of the young people are elaborated through the additional use of the software OneNote that acts as a collaborative tool. This additional method followed up the focus groups and was used to see if there were any additional views that the young

people wanted to share following the focus groups. OneNote can be seen as an innovative use of technology for research purposes.

The aim, of these data was to develop students' narratives initiated in the focus groups, both sources of data provide the basis for an account of their decisions in using technology in relation to their learning horizons. Here, the data the students contribute will be woven into a narrative or a chain of events (Yin, 1989). A narrative approach invites participants to re-live the salient moments of their past enabling understanding of the complex and often tacit meanings of their experiences (Mattingly and Lawlor, 2000). Similarly, the narrative form provides a rich insight into students' relational patterns with respect to families, friends, contacts and the school. Throughout the qualitative research I checked with the interviewees as to whether my understanding of their narratives was consistent with theirs.

The first group of young people in the Traineeship Programme, involves them working in a placement for 2/3 days per week and then for the remaining days are in school undertaking Maths, English and Work Skills (employability) qualifications ranging from Level 1 – Level 3 (equivalent to A level) on the National Qualifications Framework (NQF). The second group, were seeking Entry level 1- Entry level 3 qualifications comprised seven 16-19-year olds on a Post 16 Study Programme designed to develop their 'Skills for Life and Work'. The young people have a range of diagnoses for SEND, with the majority having a dual-diagnosis of Asperger's Syndrome. The National Autistic Society (Autism.org.uk, 2017) states the following in relation to intelligence and language difficulties, which supports the decisions regarding the research methods employed in this thesis.

> *'People with Asperger Syndrome are of average or above average intelligence. They do not usually have the learning disabilities that many autistic people have, but they may have specific learning difficulties. They have fewer problems with speech but may still have difficulties with understanding and processing language.'*
> (Autism.org.uk, 2017. No pagination).

Using focus groups and participatory methods such as online collaborative space discussions (OneNote) allowed us to explore the '*…communicative nature of social reality...*' (Flick, et al., 2004, p.214) from certain perspectives. A focus group is, according to Thomas et al. (1995), '*…a technique involving the use of in-depth group interviews in which participants are*

selected because they are a purposive, although not necessarily representative, sampling of a specific population, this group being 'focused' on a given topic (Thomas et al., 1995, p. 206). The taking of '*cultural snapshots'* (Flick, et al., 2004, p.215) of life worlds from the inside out to better understand the points of view of those participating in them.

Focus groups are well established as a legitimate data collection method within the qualitative research tradition. The method was originally developed in the field of market research, but has become frequently used in social sciences, health and related disciplines. The rationale behind the use of focus groups is that knowledge is created through the diverse experiences and forms of knowledge of, and interaction between, participants. Focus group participants provide an audience for each other, which encourages a greater variety of communication, and therefore different contents, than other qualitative methods of data collection (Kitzinger, 1995). Using focus groups as a qualitative method, Merton et al. (1956) argue, is limited by the lack of a comprehensive methodological foundations and by some solely as the reserve of the '*…vulgar world of market research…'* (Berg, 1995, p.18).

The use of focus groups and online collaborative tools helps in describing phenomena in context. Through these methods, the attempts to seek out understanding must be considered a product of '*researcher provoked data'* (Silverman, 2014, p.209) and as such, the interpretation of meaning will be value-laden. The insistence of the value in using such participatory methods are the capacities provided to '*…facilitate the process of knowledge production as opposed to knowledge gathering, as is the case with methods such as individual interviews, surveys and checklists.* (Veale, 2005, p.254).

Focus groups consisting of familiar peers, it is anticipated, will provide a more detailed pedagogical dialogue because of the established group dynamic. Young people with Special Educational Needs and Disabilities (SEND) in new and unfamiliar situations often struggle with decontextualised and unfamiliar situations, hence methods such as formal interviews with an unknown adult could be problematic. The benefit of such group familiarity is provided by Silverman (2014), who cites Belzile and Öberg (2012) as they acknowledge each member of a focus group arrives with their own '*fundamental orientation'* but that collectively, these are better elaborated through their interactions with others' (Belzile and Öberg, 2012, p.207). This is also reminiscent in the data collected through the collaborative tool (discussed in further detail on the following section) that was embedded into the

students' classroom experience for a period of two weeks following the focus group. The students were encouraged to collaboratively, as opposed to compliantly (Georgeson et al., 2014), identify examples from their learning with the use of technology. As participants contributed to a collaboration space projected onto an Interactive Whiteboard, each young person using multiple devices could build on ideas and contribute to the discussion in new ways. This decision also supported the role that technology can play, not only in teaching and learning, but in terms of the young peoples' expectations of the inclusion of technology in practice.

The disadvantage of focus groups is that where there is a dominant voice they may influence others in their opinions. This is a well-established disadvantage of focus groups and it is important that the chairing of such groups is sensitive to this and allows participants to voice their opinions without undue influence.

The Use of Technology in Research- OneNote.

Using OneNote allowed learners to log into one space and then contribute to the document in real time, collaboratively. This means that everyone sees everyone else's responses. This was not a guided session. The initial questions (following from the focus group) were shared with the group. Then during the subsequent weeks, students were encouraged to think about their answers and add to them further answers in light of their experiences in the classroom, session by session.

The implication for technology being used in this way is that it is familiar to the students and allows for shared understanding by replicating how many of their taught sessions are delivered. Being given time at the end of each timetabled session, allows for the students to truly consider, by way of reflecting on immediate concrete examples, how they are using technology in their learning. The justification for this follows the work of Lewis and Porter (2007) who argue that when interviewing young people (particularly those with learning difficulties), it is prudent to ensure that opportunities to capture student voice are familiar and are student-centred. The use of OneNote on this account is a familiar activity for the student groups and has been central to their pedagogical activity and classroom practice. This also ensured that there was an opportunity to revisit or extend responses. The reason

for this is that for many young people with Autistic Spectrum Conditions (ASC), often find articulating perspectives challenging (Autism.org.uk, 2017).

The young people's responses will then be contrasted with the perspectives of teachers within the same school using technology in their pedagogical work. The purpose being to consider the divergence of perspectives for technology and changing practice between teachers and students.

By capturing both young people's perceptions of technology's role in learning, in and outside the classroom, we can better understand the context for this enquiry. If we then seek to understand how teachers are using technology in practice, we can tease out the potential areas for development and move to recommendations for practice. Capturing data from young people is problematic, as has been illustrated, yet the value of such attempts in a study such as this, is crucial to assessing the possibility for improved practices. The emphasis of this investigation is on the relationship between the use of technology by young people and teachers within the social situation of the classroom (Flick, et al., 2004).

The significance of using differing methods to capture and generate data, when working with young people with learning difficulties is prioritised by Lewis and Porter (2007). They argue that different methodological perspectives will capture the '*…ebb and flow…'* (p.222) of pupil voice more accurately. Similarly, they recommend the development of tools that push the boundaries of conventional practice to meet the needs of the children. Their demand for *'…research 'with' rather than 'research on*' (ibid., p.224) indicates the importance placed on participatory methods that are embodied through the inclusion of OneNote (in this study) as a tool for capturing the voice of young people. Interestingly, the voices of young people are not captured in the work of Cuban (1986), Selwyn (2014; 2015; 2016a; 2016b) or Moodie (2016).

Ethics

This research complies with the University of Bath's Ethical Implication for Research Activities (EIRA 1) and an additional review due to the sample being human participants. It adheres to the University of Bath- Code of Good Practice in Research Integrity and also falls in line with the BERA Ethical Guidelines for Educational Research (2014). All participants' consent was sought from a respective carer or parents and from the young people as

appropriate. This was clarified in a signed consent letter and also additional support was given via the telephone for any parents/guardians that required additional information (particularly in cases where there was a literacy difficulty or learning disability). Informed consent was similarly sought, following lengthy negotiations from the teachers along with the right to withdraw.

Activities were carried out by school staff as respondents to questionnaires focussing on the reflections of their use of IT and in the case of the focus groups of young people, the adults present in study were familiar to the young people. The two focus groups (recorded and transcribed verbatim) are provided alongside the text of an online collaborative space provided by Microsoft OneNote which was allocated 5-10 minutes at the end of each timetabled session for a fixed period. The issues of informed consent were discussed with the groups prior to each activity and this ensured that we were able to ascertain consistent participation (as often young people with SEND can react inconsistently to unfamiliar requests and activities (Georgeson et al., 2014) As too, is the necessity for '*ongoing'* consent that reminds participants of their entitlement to assent and dissent from the research is a key priority for working with young people with SEND in research activities (Porter and Lacey, 2005). The data received were then supplemented by the opinions of teachers, all of whom following extensive negotiation consented by return, short focussed questionnaires. This allowed the triangulation of perspectives to be facilitated, thus enhancing rigour, credibility and validity.

Emerging Perspectives on Research, Technology and SEND.

Ensuring that the voices of young people with SEND be included in research is a strong theme in the literature. Walmsley (2004), argues for the importance of 'honest reflection' and avoiding '*…sentimental biography or individual anecdotes…'* (p.65). All too often, research and policy surrounding young people with SEND is devised and introduced without the voice of the young people at its centre. Porter and Lewis (2004) caution against this approach as they articulate the work of Fielding (2004) that '*…without ensuring that it is the voice of young people with SEND that needs to be heard in research, there is a real danger that marginalisation and the unwitting corrosion of integrity will prevail in research...* (Porter and Lewis, 2004, p.296) with young people with SEND.

The significance of using different qualitative methods and technology through OneNote will help us to consider whether such methods impact on the breadth and quality of the responses given. This will also engender the '*flexing the boundaries'* that Lewis and Porter (2007) argue for, as a mechanism to increase both quality, validity and rigour in research and further to provide context for this enquiry. This '*flexing'* is trialled through the incorporation of OneNote as a research tool, which is at the boundaries of traditional research practice. It is anticipated that this use will exemplify how new technology can be used in research by illustrating a 'new' way for participants to collaborate on empirical data collection.

The implications of practices pushing the boundaries is encouraged by Lewis and Porter (2007) in the field of engaging the voice of pupils with SEND in the research process. There is an assumption here that the young people will have an '*…assumed shared meaning…*' (Lewis and Porter, 2007, p.223) in relation to technology, which is exemplified in the distinction made by Prensky (2001; 2012) that young people born after the mid-1990s represent his notion of the '*digital native'*. This description is used to refer to young people growing up within a culture familiar with the language, practices and expectations of technology as standard. This then raises the question as to whether teacher perspectives share in this understanding, or align more closely to Prensky's (2001) '*Digital Immigrant… who speak an outdated language (that of the pre-digital age),* [and] *are struggling to teach a population that speaks an entirely new language.*' (Prensky, 2001, p.2). The way that young people perceive themselves, the perception of the teachers and also the research process and the relationship to technology and its use is explored in the following section.

The Impact of Positionality in Research.

Positionality refers to the position and status of researchers in specific research contexts. These can vary as they are related to a person's world-view, their individual experiences and are coloured by particular views and beliefs. These beliefs include subjects like gender, sexuality, race and religious beliefs (Sikes, 2004). The process for acknowledging this in research is concerned with how the researcher is located in relation to the participants, the subject under study and also the research context and process (Savin-Baden and Howell Major, 2013). Some of the aspects of positionality in research are culturally ascribed or

fixed, such as the race or nationality of the researchers, yet others such as life-experience or occupation are not. The automatic assumption that such positions will lead to certain views or perspectives, however, is problematic as value-free research is scarce in social and educational fields (Cohen et al., 2011).

There is a continuing need within social science research to acknowledge and address the potential for claims of bias. Sikes (2004) elucidates this more clearly in the following:

> *'It is important for all researchers to spend some time thinking about how they are paradigmatically and philosophically positioned and for them to be aware of how their positioning and the fundamental assumptions they hold might influence their research related thinking and practice. This is about being a reflexive and reflective and, therefore, a rigorous researcher who is able to present their findings and interpretations in the confidence that they have thought about, acknowledged and been honest and explicit about their stance and the influence it has had upon their work. This is important given that a major criticism of much educational research is that it is biased and partisan.'* (Sikes, 2004, p.15).

Critical attention to positionality is necessary in research as it allows a level of reflexivity toward the production of knowledge that results from inherent power relations. This articulation of 'self' is significant for this thesis as it is concerned with the views of young people and teachers, both of whom identify as 'related' to the researcher. The first as a group of young people that view the researcher as an authority figure, which has implications for the data collection and interpretation. Then further, the views of the teachers, for whom the researcher is a member of the Senior Management Team (SMT) of their employing organisation, with the direct responsibility for their line-management. A discussion of the ways that positionality influences design, execution and interpretation which were highlighted by Greenbank (2003) follows.

Issues of Positionality and the Teachers in this Study

As discussed above, the originally planned focus groups for the teachers became problematic. There is an explicit expectation on them to lead and champion the use of IT in learning yet on consultation, there was a conflict regarding their consent to participate.

The teachers were not prepared to take part in a focus group regarding how and to what extent they used technology as they were concerned about the implications of their line manager's dual role. The implication that the role of a researcher being either an insider or outsider is important here. Mercer (2007) argues that you can never really separate yourself from the topic being studied and the researcher-subject relationship is a continuum '…*with multiple dimensions, and that all researchers constantly move back and forth along a number of axes, depending on time, location, participants and topic…'* (ibid., p.1). The implications of Mercer's (2007) argument can be seen in the discussion that follows.

As a senior leader within the school, my role requires me to observe, moderate, support and nurture teaching practice. This includes supporting teacher-proficiency in the use of technology. Being a leader responsible for lesson observation, moderation of teaching practice and performance management of teachers against professional standards, presupposes a power relationship that will impact on the validity of the responses given. To take part in research conducted by your line manager that attempts to capture the challenges in using technology in learning, may be seen to have a direct bearing on progression and promotion opportunities and in some situations, concerns over performance.

This reflection is significant as it directly articulates that challenges associated with positionality. The reticence of the teachers to expose themselves in a focus group or interview was a direct result of my position within the process. Questions of *'membership'* (Merton, 1972) are concerned with the extent to which those conducting the research can consider themselves aligned with, or part of, the specified and collective social statuses of those being studied. The tension on this account, stems from the ability of an 'outsider' to wholly comprehend the experiences and nature of those 'inside'. Conversely, the question is if an 'insider' can truly disconnect from the nature of themselves, and that which is being researched, to act without bias.

The arguments for, and against the insider/outsider debate go some way to contextualise the challenges faced during this thesis' development. Of importance is the suggestion that being an insider provides you with the ability to ask meaningful or insightful questions through the possession of *a priori* knowledge. However, such a perspective is problematic when applied across both young people and teachers. Discussing provocative or taboo

questions with employees is problematic. An example of the tension can be seen in the role of researcher as one who is open to enquiry and wanting to understand. This role could be considered antithetical to the line manager for whom the articulation of incompetence, dissention or avoidance could result in further action.

It is this blurring of the boundaries that makes the construction of such a dichotomy challenging. Yet, to acknowledge that the relationship and position of those involved in the process is important. The relative position of the researcher, nature of the researcher-subject relationships and the tensions encountered are discussed in the following two sections.

Issues of Positionality and the Young People in this Study

As the teacher and responsible adult in the classroom, my role will impact on the validity and rigour of the responses given. I am a familiar adult to the groups of young people and in the main have taught them for much of their time in education. The accounts of *positionality*, such as those offered by Cohen et al. (2011) and Merton (1972) are noteworthy as they draw into question the challenge of assuming a different role to that of the teacher. There is an implication here in terms of the prior relationships and expectations of both the young people and then myself as researcher/teacher. Guidance and instruction will come from the teacher as an authority figure, whilst the role of researcher is one of empowering the young people to articulate their experiences and opinion of technology use, which may well be affected by my presence. This conflict in relation to presupposed authority is similarly evident in the interactions discussed in the next section between myself and the four teacher colleagues that participated in the enquiry.

By acknowledging the conflicts in relation to the 'position' of the researcher, various devices were employed to acknowledge and mitigate these where possible. During the focus groups, there was also a support assistant with whom the young people are familiar. Their support of the young people sought to level the distance between myself as researcher and a person in authority and the young people as students or subjects. The role of familiar adults to reinforce *typicality* in the practice of research is significant, as Lewis and Porter (2007) argue. Maintaining typical processes as much as possible in research will reinforce a shared meaning that contributes to greater validity in response. This concern also reinforced

the decision to use OneNote to capture data. The familiarity of the software to the students, allowed for greater autonomy and was intended to increase validity in the responses. In allowing space, less direction and probing, we can expect to see greater understanding of the context for technology in learning, rather than by direct questioning. This is important because of the young people's need for greater processing time, their inability to articulate the correct response under pressure and also to require context for expressing accurate

Given that technology is used daily in the classes of the young people, giving time at the end of each session to reflect on *how* and *why* technology is used should mitigate the challenges associated with responding to the more abstract questions in the focus groups. Attempting to identify, and to some extent capture both academic and non-academic use of technology was central to this enquiry. The intention being that by understanding how young people use technology more widely, the opportunity to consider its role, function and purpose in pedagogy would eventuate.

Drawing on the previous literature, it was assumed that issues of motivation, interest and capacity and skill would be identified as significant factors in young people's use. The historical analysis of technology was useful in identifying potential areas for shifting practice and could form the basis of that which we might expect to witness.

Thematic Approach for Analysis

Thematic analysis is concerned with searching through data to identify recurrent patterns or themes (Braun and Clarke, 2006). A theme is a cluster of linked categories conveying similar meanings that emerge through the analytic process. Yin (1989) suggests that to provide some conceptual understanding to the process of thematic analysis, stages are required i.e. examining, categorising and tabulating or otherwise recombining the data, in order to revisit the original *'aims'* of a study.

To begin analysis a researcher must have at least some conceptual understanding to guide the insight processes. These insights are drawn from the literature and further from the analysis of the impact of the Gutenberg press which may act as an initiator in identifying themes. This approach will allow the examination of ways that meanings and experiences are operating within the school, the classroom and outside the school. As is expected, any analytical approach will carry with it a number of assumptions about the nature of data,

what they 'might' represent and how this is related to the 'real world'. This is further clarified in the following section, which argues to justify the use of key themes to guide the process.

Revisiting Themes

Braun and Clarke (2006) remind us that a theme is something that is significant in terms of the relationship between data *and* the research question. Krueger and Casey (2000) build on this concept and suggest analysis is stronger and more rigorous when mindful of the *intention* or *purpose* of the study. On this account, the intention is to consider that which informed the research, the approach and key 'themes' drawn out in the literature that underpinned the process. Krueger and Casey (2000) develop this view to cover the way generated data are interrogated and selected; with the intention of adopting an approach that attempts to minimise subjectivism. The challenges for all data analysis is that the selection and use of themes can be problematic as by choosing a certain 'theme' is to give meaning to it, to the exclusion of other possible meanings. It is important, therefore, to determine the type of analysis and further to justify this. The use of analysis for this thesis will be informed by '*Rich Description*' as outlined by Braun and Clarke (2006), it will be employed as a means to ensuring that the reader is able to get a sense for the *predominant* and *important* themes. This approach is useful as it will allow us to consider the analysis of the Gutenberg press alongside the empirical data, and investigate '*…under researched areas* [and provide a greater understanding of] *participants whose views on a topic are not yet known.* (Braun and Clarke, 2006, p.83)

Chapter 4. The Story of the Gutenberg Press

The section will consider how the Gutenberg press brought about social change, by way of providing a better understanding of what we might expect from 21st century technology. This section can only be a reflection of the time it seeks to understand. It is informed by accounts within the literature and perspectives of the conditions of the time. It is Moodie (2016) who argues that the use of history is important to this discussion as it allows us to examine changing practice as a mechanism to consider how we might make sense of the current technological revolution.

The intention behind this chapter is to understand the conditions of the time and to tease out the parallels on which the latter chapters will draw. Each account in this section represents a perspective, and whilst they are used to 'paint a picture' of very different time in history, each social vignette highlights changes arguably brought about *by* technological innovation. Very little in the literature of the fifteenth century recorded the *impact* of technology. What is evident however, is the articulation of a social culture of strict practises with regard to how knowledge was considered, communicated and accessed.

Central to the following section is the distinction made by Lievrouw and Livingstone (2002), which separates the artefact itself from the impact it made on society and the following activities resulting from its inception.

The Gutenberg Press

Johannes Gutenberg's (c1398-1468) incorporation of a metal matrix, individual moveable letters, punctuation, numerals and an apposite blending of printing ink seems insignificant in contemporary terms. The press' impact was heralded as a '*…turning point in the history of civilization'* (Steinberg, 1974, p.35). The Gutenberg press gained its inception amidst growing inventions such as gunpowder and portable firearms whose '*…force, effect and consequence…*' Bacon and Devey (1902, p.29) consider worthy of note.

As an artefact, exclusivity cannot be attributed to Gutenberg as printing presses, *per se*, arrived much earlier than the fifteenth century. The specificity of Gutenberg's particular tool, with moveable type is now considered an agent of significant change (Eisenstein,

1980). What it represents in terms of its artefacts, contexts and activities is explored in the following sections.

The Printed Word

Whilst the focus of this section is on the Gutenberg press, it is prudent to pick up a conversation on the Press' resultant artefacts. The printed word is the focus of the following section. Printing, spurred a renewed interest in knowledge in two distinct ways. (1) Through the preservation of texts and (2) through an increased multiplicity of texts available (Baron et al., 2007). A newfound personal embracing of the consumption of the printed word resulted in unprecedented divergence in interpretations in religious and philosophical texts. This shifting social practice represented unique ways to now engage with and access information, which had been monopolised by the Church (McLean, 1972).

Being able to question, challenge and oppose ideas and contribute to new understanding required the development of new skill-sets, such as the formation of communities defined by printed material in order to discuss new ideas. There is evidence of specific groups (of variable socio-economic and employment statuses) coming together to consume, share and consider printed texts (Febvre and Martin, 1976). Direct access leading to desire for possession of printed texts with contrasting opinion, translation, and interpretation required being able to select, consume and examine texts on one's own terms and engage with others in '*…combinatory intellectual activity…*' (Koestler, 1959, p.53). The ability to be immortalised in print was innovative in that it marked a departure from orality to permanence (Eisenstein, 1983).

Concern for how the impact of the printed word began to represent new (or different) knowledge was raised. The Church criticised diversion from the attendant diligence and devotion obtained through sacred texts (Eisenstein, 1983). Outside the Church, the Printing Press' popularity and potential were welcomed more widely, which caused the Church to later adjust its position. Whilst brief, what we have tried to articulate in this section is a sense of changing perspectives for information and social practices. The printing press as a tool created new activities and contexts which are in line with the classification of changes outlined by Lievrouw and Livingstone (2002). The challenge for the church on this account is that the opportunities provided by technology contradicted the practices of the Church.

Practices of the Church

The culture of the fifteenth century as suggested by Birkerts (1994) was primarily oral and was dominated by religiosity. He suggests that reading was a skill, particular to only a small number of people. The clergy's use of this skill represented a 'power' that the Church, held over its parishioners. Generally illiterate, parishioners considered the Church as central to their receiving of both moral and spiritual guidance (McLean, 1972). The laity did not work *for* the Church in ways that we would currently consider occupational, yet the relationship between church and the dependency of its people was central to the existence and survival of lay people. The introduction of the term 'laity' to define the parishioners as a distinct group of people is significant as it was used to define them as church-dependent (McLean, 1972).

How technology (such as the printing press) strengthened the hand of the lay people (Febvre and Martin, 1976) is developed further in the later sections, but first the focus is on the social contexts of the fifteenth century. The printing press, as Febvre and Martin (1976) remind us, represented alternative means of communicating and distributing accepted '*knowledge*', which to date had been the primary reserve of the Church. The press began as a mechanism for the mass reproduction of literature, which in simple terms broadened capacity, for not only text but also the potential audience. Febvre and Martin (1976) suggest that the capacity to engage, and weave opposing perceptions and thoughts and to some extent question received wisdom, provided the context for a change in social practices. An example of these changes is the revision of *who* could attain access to printed information and more crucially, the knowledge with which to contextualise it.

Changing Roles; the Rise of Individualism and New Perspectives.

Prior to Gutenberg's invention, the reproduction of information (as dictated by the Church), was primarily fulfilled by scribes and priests. As the printing press developed and technological mechanisation improved, the capacity to replicate forms of information by different means increased. The roles of certain members of the church were also perceived to be compromised by the inception of the new technology represented by the Gutenberg press. The clergy recognised a decreasing attendance at services, which was quickly attributed to the availability of the printed word. Having another source of information

brought into question the authority and status of those tasked with leading services in church (Eisenstein, 1983).

The popularity and curiosity of the printed book led to interactions between culturally diverse social groups. It was common to see priests and abbots working as editors and correctors, or royal clerks working in chanceries alongside poets, lay brothers, and workers. Eisenstein (1983) in her later work highlights the importance of such cross-cultural collaboration, which appeared no longer to be determined by clerical status but a melding pot of *'…town and gown…'* (Eisenstein, 1983, p.28) as a subtle shift in social practice. The potentially democratising nature of technology is, also, a theme that can be seen in the twenty-first century discourse.

Following the introduction of the printing press, a shifting relationship between the Church and its parishioners emerged. The renegotiation of the terms of the relationship was not without challenges. Accepting the church as responsible for providing spiritual, moral, educational or financial wellbeing was problematic when alternative possibilities became available. Disagreeing with that which was '*taught*' by the Church, or to question motives and intentions risked significant consequences, such as excommunication. Eisenstein (1980) summarises the changing relationship as a tension in the extent to which laypeople were prepared to express opposing views or argue for differing opinions.

Alternative perspectives provided by the Printing Press, Eisenstein (1983) suggests, fuelled a curiosity of the world outside that administered by the Church. Being able to obtain and read personal copies of religious works, or to be able to access alternative viewpoints was a significant shift. Printed books on a variety of subjects aside from religion brought about further compromises in the relationship (and interdependence) of church, state, and its people. A widely reported impact is the weakening of the power of the Church by the press (Eisenstein, 1983). The opportunity to engage with differing perspectives and opinion was significant as it represented a change in the conditions by which knowledge was collated, recalled, and shared.

An increasing thirst for knowledge, alongside being able to refute and challenge others' beliefs is considered by some to have been vital to the *Renaissance* as part of the scientific revolution (Krummel, 1980; Wootton, 2015). However, impacts were not immediate; being

almost a full one and a half centuries after its inception that the printing press allowed new *weltanschauung* into view (Eisenstein, 1980; Johns, 1998). The importance of this perspective is elaborated in contemporary terms in the following chapter. It will be seen from this brief example that the time scales between the advent of Gutenberg's printing press and its impact could extend to centuries. And a clear question is whether the same timescales can be applied to new technology today.

What these changes point to is how the printing press altered people's understanding of roles, personal esteem and agency, as well as multiplying sources and access to knowledge. The parallels are further elaborated in the following chapter, which provides a twenty-first century perspective.

Conclusion of Key Shifts in Practice

This section asked what does this story of the Gutenberg press tell us about the application of new digital technologies today and why is it relevant? What are the key themes that we can take from both the literature review and this chapter in order to better understand why and what we were looking for in the empirical study?

Below is a summary of the key shifts in social behaviour resulting from the impact of the Gutenberg press' introduction using the categories defined by Livingstone and Lievrouw (2002).

Artefacts and Devices:

- The introduction of new tools (e.g. the Press) which resulted in diverse social groups being able to communicate more readily and widely
- Locality and dependency are accelerated by technology.

Activities and Practices:

- Democratising the technology brought about engagement between disparate groups of people.
- Changed and broadened perceptions of the wider 'world'.
- Provided alternative ways to access information.

Context:

- Technology allowed different spaces for access to knowledge to occur.
- Provide alternative perspectives and interpretations on information and differing views (not filtered by the church)
- Changing notions of self, role and personal agency.

Reviewing the impact that Gutenberg's invention had on social practices allows a way for us to consider whether we can anticipate parallels with the current technological revolution. What follows is an exploration that accounts for the differing conditions of the twenty-first century, but assumes that there will be indications of the changes articulated as a result of the Gutenberg press.

Chapter 5. Technology and the Twenty-First Century

Earlier in this thesis, the role of technology was presented as a trigger that was embedded in a specific social context which brought about social change. The conditions of the fifteenth and twenty-first centuries represent differing understandings of the introduction of technology. In the following section, the parallels and changes between the centuries are articulated. These are presented to contextualise and similarly align the differing conditions of the fifteenth and the twenty-first centuries. To assume that modern readers' responses to current technology are consistent with those of the fifteenth century is problematic. However, the questions raised concerning *how* technology impacts on social change in the fifteenth century are reflected in the conditions of modernity in the twenty-first century. The following section uses the themes identified by Lievrouw and Livingstone (2002) by way of maintaining a consistent approach in the thesis.

Artefacts, Devices and Change.

The last century has witnessed a technological revolution in that there is a saturation of new technology available and Gates (1996) reminds us that an '*Information Age'* is upon us. The rate of development makes the breadth of technological applications difficult to grasp, however, there is a significant literature that is explored in this chapter that highlights the extensive impact across society. These changes are at times transitory, but all lead to an understanding of how current social and knowledge practices are changing in response to technology.

In the fifteenth century, we witnessed the introduction of new tools and devices that brought about the opportunity for greater communication and changes in social roles. The advent of the Personal Computer (PC) in the late twentieth century was a key point in the twenty-first century technological movement. In approximately 20 years, the PC was replaced by portable computers, laptops and newer smart and wearable technologies and the introduction and development of the Internet became commonplace. Contrasted against fifteenth century conditions, the proliferation of tools is considerable. The impact of these devices was the opportunities for communication across increasingly larger contexts, spaces and time zones.

Previous technologies were inherently linked with time, such as the letter or postal system, which, whilst effective were dependent on the physical act of collection, transportation, and delivery. Whereas, the digital technologies such as the Internet, email, PCs and tablets (are still time dependent in some ways) but allow for more effective methods of interaction across time. Practically, the capacity to communicate or broadcast faster and wider and the increased range of communication has given the individual, in principle greater power over the relationship and knowledge.

Individualisation and New Technology

While the Gutenberg press changed the roles of the clergy, academics and the general populace, it can be argued that new technology has exacerbated the development of individualisation. At the turn of the century, Durkheim (1983) was concerned by how society could maintain integration in an increasingly industrial world. Acknowledging that the changing of established daily routines, embedded in local communities, was a result of industrialisation and mechanisation, Durkheim (1983) proposed that increasing social complexity encouraged individuals to break away from, or opt out of routines and processes with which they were familiar. Durkheim referred to this as a form of individualisation. In effect, as the routines of rural communities were broken up by the exodus to the cities, so individuals were dis-embedded from their communities. In the present era, Beck (1992) has argued that this process has been accelerated so he uses the concept of *late modernity* as a way of labelling this changing situation.

Beck (1992) proposes that the result of individuals dis-embedding from the routines of industrial society, requires individuals to '…*produce, stage and cobble together* [new] *biographies* [about] *themselves* (Beck, 1992, p.13) From this perspective, it can be argued that we have more knowledge than ever before (with which to do so) yet, as Lauder et al. (2006) identify, there remains an even greater '…*uncertainty and contestation*' (Lauder et al., 2006, p.22) as a result. The increased ubiquity of knowledge afforded by technology requires consideration of how we review and revise our practices in all areas of life. It could be argued that technology is one such catalyst for the redefinition of social activity since it gives individuals greater control over how they communicate and with whom. It also provides, in principle, greater control over the way they access knowledge. The smart

phone, the tablet and new forms of PC enable such control by the individual. As such, the technology enables the possibility of greater individualisation.

Activities and Practices: Technology and New Ways of connecting

The Gutenberg press has been shown to widen access to knowledge and debate. This is seen in the way that printed books provided greater opportunities for knowledge and debate, and further necessitated the engagement between disparate groups of people.

The scale and scope of this change in social practice, is not just a matter of quantity or volume. It is important to acknowledge that increased capacity allows for a greater distribution of the potential to access information. The more that knowledge and new views of the world are created and collectively distributed, the more widely that knowledge reflects the conditions of the society it illuminates.

Examples of alternative ways to access information in the twenty first century can be seen in the following that highlights the way technology can link disparate pieces of information (e.g. hyperlinks) and broaden perceptions of the wider 'world'.

In 1984, Berners-Lee combined the use of hypertext (a way of linking different pieces of information) with a network developed by the Advanced Research Projects Agency Network (ARPANET) to devise a '*…a world of shared information through which people could communicate with each other and with machines…*' (Berners-Lee, 1996, p.34), which soon became known as the World Wide Web (WWW). In its earliest phase, the WWW served as a medium for the publication and production of vast swathes of material, purely for reading. Developments following Berners-Lee's idea led to more interactive interfaces enabling other media to be connected such as video, photographs, documents and recordings.

An increasing social desire to engage with 'information' now available on the WWW broadened wider relationships between users, not limited by physical or geographical location. The presupposition for physical proximity is significant as this extends the trend initiated by the Gutenberg press, whose impact brought about greater collaboration across geographic communities that had hitherto been limited by physical distance. However, the distance has now been extended across space-time in the global community.

A founding principle of the Internet's design was the intention to facilitate and actively encourage 'random' associations between seemingly arbitrary objects, such as pages, documents, comments or posts, marking a diversion from traditional assumptions of linearity (Bijker et al., 1987). Hypertext was the term given to such association by virtue of its capacity to allow for links, or connections to be determined *by* users. This again extends the role of the individual and suggests active participation in the process, much like the way that the printed word was shown to change social relations.

The final parallel that can be drawn is that of sources of information and knowledge and the debates they engender particularly as we have recently seen in the political realm. Questions such as whose knowledge is it and from where does this come, whether it be in relation to debates about the environment or fake news abound. It is not only individuals who are impacted by technology, institutions, such as those of education, can also potentially, change. Access to multiple forms of information and evidence could challenge relationships in schools and colleges, in much the same way as the publications that were enabled by the Gutenberg press challenged the authority of the Roman Church, as the sole providers of legitimate knowledge.

The tension in education is that technology provides opportunities to access non-sanctioned, alternative perspectives and bodies of knowledge. Digital technology, such as the internet, opens up a discussion as to whether the nature of knowledge is changing. This is evident in the ways that people are now accessing knowledge, through the internet as McEneaney (2015) suggests. In turn, this raises the question of whether the advent of these new technologies and the social practices to which they give rise can challenge the way school knowledge is determined, assessed and conferred upon students.

In this sense, just as with the consequences of the advent of the Gutenberg press, new technologies have the possibilities of subverting and challenging knowledge which is based on status and hierarchy. The impact of technology, on this account, is witnessed in the shifting dependency between certain groups, institutions or hierarchies. Technological development is perceived to have the power to subvert powerful institutions such as Governments, Churches and State organisations; a parallel that Builder (1990) draws with Gutenberg's press in the mid-fifteenth century. The true impact of the printing press, Builder (1990) argues, was not apparent for nearly two centuries after its inception,

therefore if we draw this parallel we are in the early stages of enlightenment with regard to contemporary technology as it is still in its infancy.

Context as a Way of Understanding.

The key themes for this section are concerned with technological innovation and the way this impacts on how we understand our role, agency and sense of self and others. We have noted how technology reframes how we interact other peoples and as such, forces us to account for and navigate different and 'abstract spaces' (e.g., cloud, virtual relations such as through Skype). The trend initiated by Gutenberg, continues to take us away from the local and the particular. This is a significant shift in terms of relationships when considered in terms of time and space (Giddens, 1991).

The way that technology brings about revisions of our understanding of self in relation to others is an important feature of modernity. The Internet can be used to illustrate one example of how technology can bring about such revision. The manner, in which it promulgates knowledge between people, is a theme that Epstein (2008) argues, epitomises the diffusion of ideas by collaboration and interaction across space time and diverse communities. These ideas then force the reconceptualisation of self.

The capacity to compress or mitigate time-space, according to Giddens (1991) impacts on social relationships by stripping out or dis-embedding the traditional mechanisms of cohesion, so that social relations can be established without regard to place. Such a capacity shifts our understanding of self in terms of our making sense of the external world, there is a sense in which we can become citizens with dual or more identities, we are people of the globe and of particular nations and ethnicities, gender and sexualities.

Giddens' (1991) concept of *Modernity* allows for a greater understanding of what is meant by the changing *frames of reference* with which we make sense of ourselves. If we are to use Lievrouw and Livingstone's (2002) terminology, then we are focussing on the way that our activity helps us to understand our role in society. Changing frames of reference also create a tension between the global and the local, which provokes self-reflexivity. Individuals are contextually situated in space and time, Giddens (1991) suggests, and as such will encounter their respective *phenomenal world* (wider association and global engagement) alongside their local life. Giddens (1991) reminds us that individuals must

appropriate *mediated information* such as that in a newspaper, online or through telecommunications to make sense of the relationship between themselves and others.

Giddens (1991) acknowledges when appropriating mediated information there is a risk of powerlessness, as the Internet also removes us from the specific and the local causing '*fragmentation*'. In one way, Giddens (1991) suggest we are more empowered, in another we can also become powerless. Late modernity has its own contradictions

The analysis of the fifteenth and twenty-first centuries has illustrated that there are similarities in terms of what and how technology might bring about change in social practices. A comparison and summary of these shifts is given in figure 2 below. The task of the section that follows is to now test these by empirical means. How is technology being used in the classroom and does its introduction change practice? Are teachers and young people using technology in innovative ways that warrant emphasising? What are the barriers that inhibit use? How do these barriers align with those suggested by Selwyn (2015), Cuban (1986; 2003) and Moodie (2016)?

Fifteenth Century Changes	Twenty First Changes
Artefacts and Devices • Tools by which social groups can communicate more readily and widely • Locality and dependency accelerated by technology. **Activities and Practices:** • Democratising nature of technology brought about engagement between disparate groups of people. • Broaden a more accurate perception of the wider 'world' (at all levels) • Provided alternative ways to access information. **Context:** • Technology allowed different spaces for access to knowledge to occur. • Provide alternative perspectives and interpretations on information and differing views (not filtered by the church) • Changing notions of self, role and personal agency.	**Artefacts and Devices:** • Proliferation of devices that provide increased many-to-many communication therefore, physical proximity or geography less important • Technology accepted as capacious (speed, efficiency, accuracy, up to date). **Activities and Practices:** • Globalisation and inter-connectedness is normative and this impacts on notions of self, time and space. • Review 'place' in the world and opportunity to expect changing worldviews. • Technology can associate disparate pieces of information (e.g. hyperlinks) • Provokes debates: whose knowledge is it and where does this come from? **Context:** • Reframes how we interact and in what space (formal/informal/public/private). Increasing acceptance of 'abstract spaces' (cloud, virtual etc.) and the necessity for collaboration/open platforms. • Hierarchies and roles challenged with reduction in dependence on socially constructed expert/professional.

Figure 2 Summary of Key Shifts across 15th and 21st Centuries

Chapter 6. Analysis of Empirical Data

The Teachers' Views

The questionnaires had seven items designed to capture an overview of how the teachers are using IT. The questions were posed to acknowledge the challenges associated with their use and the potential impact and effect on teaching and learning. The questions were as follows;

1. What kinds of technology do you use; where do you use it and what do you use it for?
2. Describe how technology helps you out of school.
3. Describe how technology helps you in school.
4. In what ways could technology be better used in learning?
5. What are the challenges of using technology?
6. Has technology allowed you to do something that you couldn't before? Give examples.
7. What are the barriers that prevent you from using IT in your teaching?

These questions were designed to mirror that discussed in the focus groups with the young people and to capture the comparative use of technology in specific spaces and contexts. The questions are generally open to allow for freedom of expression rather than confine respondents to closed questions. In the following analysis, not all the questions are discussed in sequence, rather responses are identified which address themes and tensions that extend across the four teachers.

Analysis of Teacher A's Responses.

The first question is looking for more than factual information since it can be seen as an indicator of the degree of sophistication that teachers have when it comes to their personal IT use. We might then assess to what extent their facility with IT at home translates into their use of IT at school.

In Teacher A's case, the use of IT seems to be what we might expect in terms of use from someone who has been teaching for quite a long time and for whom IT seems something of a puzzle.

For example, to the question:

Describe How Technology Helps You Outside of School, she responds:

- *Mobile technology ensures connectivity with the school setting when I am away from the school site*

- *Enables me to work offsite- but I can only access stuff* [if] *I have wifi, which doesn't really help all of the time. If I am expected to be contactable all of the time then I can't always do this. If you have everything at the touch of your fingers, but then you are not within wifi range then how can you access this? Storing to the cloud and using the cloud is good, but without wifi you cannot access your knowledge!*

So here it seems that there are difficulties with connectivity. This apparent uneasiness in being connected translates into an account of how she uses IT at school. To the question, **describe how technology helps you in school?** She responds as follows:

- *Is the backbone of internal and external communication*
- *Enables work to be presented and quickly shared in a high quality and easily accessible format*
- *Allows others to access work and add to it*
- *Provides a ready source of information and support*
- *Provides webhosted software for management of personal pupil and staff data, tracking of pupil progress and attainment etc.*
- *Management of publicity and key information sharing with parents/carers and the wider community*

- *Support storage and easy access to electronic documentation*

The majority of these responses appear to be related to administration, tracking pupil progress and information sharing with parents/carers.

Perhaps her most significant responses are to the question: **In what ways could technology be better used in learning?**

- *Higher focus on the teaching of keyboard skills*

-*Improvements to filtering arrangements*

Here she mentions keyboard skills and filtering arrangements. These are not really about learning but about the conditions which may be considered necessary for focused learning.

An anxiety about the use of IT is communicated through the question: **What are the challenges of using technology?**

- *Limited financial resources – needing to make do with and mend aged and life expired hardware*
- *Internet connectivity*
- *Pace of change and upgrades*
- *Lack of time to keep up with developments*
- *I am worried that my students will know more about it than me!*

Emerging from Teacher A's responses is the necessity for training and upskilling which will enable her to maintain the traditional role of teacher as leader. The challenge associated with these data are that somehow technology draws into question the authority of the role of teacher and that of the student.

We begin to see how the use of technology may well develop in practice. Interestingly, these responses only articulate the non-learning elements of technology use and illustrate the potentials for organising and administrating the pedagogic process.

Has technology allowed you to do something that you couldn't before- give examples?

- *Improved communication – use of OneNote*
- *Ability to collaborate in the development of projects and plans - OneNote*
- *Instantaneous sharing of information with the school workforce, parents/carers and the wider community – Office 365 calendar, school website, texting service, school/PTA Facebook page*
- *Ability to access electronic documents anytime, anywhere – OneDrive*

Similarly, these responses echo those above and point towards administration and communication with colleagues. We are still yet to see how technology might change teaching and learning practices. The approach to supporting teachers to be confident and

skilled in the use of technology for learning remains unaddressed. This is central to the barriers identified as follows:

What are the barriers that prevent you from using IT in your teaching?

In responding to this question Teacher A raises a number of related issues. It seems clear that she considers that IT has changed the role of teacher:

- I am good at teaching but the job is no longer about you having understood the topic or subject and then you pass this to the learners through your teaching. You are expected to be multimodal and online but I think that this is hard. How can I measure or mark students' learning online? Where will I put the ticks and comments? How can I send this off?

Here we can see how the new ways of assessing learning present her with a challenge. This concern is, perhaps, reflected in in a lack of confidence in using IT. She says:

- I think that it is assumed you know what to do. I trained as a teacher when there was not as much IT as there is now. Young people have grown up with it and as part of their development have learned how to access, use and be confident. They know how things connect online. It is often expected that you will be on social media, know what a wiki is and how you use this in you teaching. For me, it is really a challenge.

She also has ethical concerns that present another facet of the challenge that IT presents:

- Just because it exists, this does not mean that you should [use it]. *I worry about privacy and how young people are connecting with each other and with strangers that they might be meeting. I also am concerned that young people are sharing images with others online and not knowing how and where these are being stored or by who.*

- Part of my role as a tutor is to provide pastoral support but the young people know more than me when it comes to technology. Students are used to expecting things quicker and being able to communicate or interact with others faster. They do not understand the postal service or recording VHS from the TV. Streaming, instant, multitasking are all assumed, but older people like me are not that au fait.

She sums up her concerns in the following way:

- I think it needs a revision of what a teacher means nowadays as the job is quite different.

What is significant about Teacher A's views is that while she sees the advent of IT as a challenge much of her thinking is not about how it can be used to promote learning, while the advantages that she sees concern largely administrative tasks. The concluding perception given by Teacher A is that she felt that her role as a teacher is challenged as a

result of IT. This is particularly important to this study as there are emerging themes from the historical analysis that suggest technology can provide an opportunity to review our role in relation to the world around us, but also in terms of how we interact and make sense of our self and others.

Given that Teacher A is an experienced teacher it seems prudent to explore whether such themes emerge from a different teacher for whom SEND teaching is a new experience.

Analysis of Teacher B's Responses

Teacher B regularly uses a variety of technologies both at work and in her private life. She goes to great lengths to explain that she is online and actively engaging by being interconnected. She is also acknowledging the usefulness of having the capacity to use multiple applications and functions to provide her with the information she needs to go about her everyday life. She demonstrates these positions in her responses to being asked to **describe how technology helps you outside of school**. She states:

-*Technology helps me outside of school by keeping me connected to the world around me.*

- *…easily able to access what my friends are doing, keep up to date with latest news, check the weather in my area, or where I am going…share events with friends-*

- *…useful to have everything at the touch of a button when I need it.*

The simplicity and ease of access in being able to bring together different information sources is significant. It represents the articulation and acknowledgment of a 'range' of uses. This is pertinent in the deciding of content to be transmitted in traditional education systems.

Teacher B suggests that in response to being asked to **describe how technology helps you in school** that without technology:

- *I would not have a job!*

The differences between Teacher A and B in terms of the role of technology in education is significant as Teacher A articulates a sense of loss (in terms of that which she was taught to

'do' as teacher and that which is required of her now) whereas Teacher B is keen to highlight the opportunities now provided. She states in response to being asked to **describe how technology helps you in school:**

- Without technology in school it would be a lot harder for staff to instantly access knowledge.

- There's no more going to the library and letting them know tomorrow.

- The teacher looks it up there and then and has the answer

-If we forget the answer is so instantly recoverable with the use of a device with access to the internet.

- School cannot do without!

- Technology enhances the learning experience, students become more engaged.

The way that technology can change the role of a teacher and their practice comes through in the responses from Teacher B as she articulates the way that a teacher must adapt and change their role when asked **what are the challenges of using technology?**

- having time to familiarise yourself with the way things work and then using that before things move on and then being stuck in this cycle having to relearn/reteach things often as technology moves on.

- I need to be the leader in my classroom so really I have to practice as the group will have much better working knowledge of technology in everyday practice, whilst at school it is still underdeveloped.

- a new way of think[ing]

- it means I need to change how I teach acknowledging that technology will be the most up to date.

- a million new ways, process, techniques and passwords.

There are tensions that arise from Teacher B's responses. She points towards the processes and arrangements for assessment and administration of learning with technology. These she suggests, appear to conflict with the way that technology is used outside of school. These are summarised in the following which is taken from the response to the question **what are the barriers that prevent you from using IT in your teaching?**

- Examination bodies do not accept some formats/evidence so you must return to the old ways of relying on Word or creating paper copies for sending to the examiners. The difficulty here is that young people very rarely use paper and most qualifications such as the employability certificate require you to submit a printed CV and completed application form (in black ink/capital letters) but in real life [sic] *this would be done online. Therefore, the way we are assessing learners does not really equate to their experiences and can be contradictory.*

This is a significant point because it seems that it is also the examination bodies that are behind the times when it comes to the use of IT.

The manner in which technology cannot always be used also emerges in the response to the question **what are the barriers that prevent you from using IT in your teaching?**

- This is a challenge with autistic young people for whom we know that generalisability, abstraction and transferability need to be taught rather than assumed. I remember one Functional Skills exam (which is supposed to be the most appropriate for Post 16 students as it is related to real life functionality (rather than theory etc.) where the students were asked to draft, proof read and then write…a text message (on paper).

Here she points to a paradox, in that while some elements of pedagogy such as generalisability and abstraction have to be taught, it is then applied using IT in the form of a text.

Teacher B represents an open perspective on the potential that technology affords the way the role of teacher is executed. When we compare Teachers A and B it becomes clear that the manner in which technology is embraced and used in teaching is related to the motivation, enthusiasm and confidence of the teacher. The tentative assumption that the level of use and engagement with technology in teaching is related to age or experience seems evident, yet the following analysis of Teacher C seems to offer a counter-perspective.

Analysis of Teacher C's Responses

Teacher C's responses represent the emergence of a tension between the potential for IT in teaching and learning and the different generational expectations of teachers and young people. Arising from these responses is a suggestion that the way that technology is being used by young people outside of the classroom is significant for how it might be used within. The following is an example:

When asked to consider **in what ways technology could be better used in learning?** Teacher C is aware of the challenge that IT presents and is prepared to embrace it: We can see this in the following:

-People also need to be more willing to try new things and learn with the pupils.

He is also aware that it can be used in ways that do not promote learning. Rather than just 'used' as – *It needs to add something within a learning framework but too often becomes a holding activity. There needs to be a clear structure to how technology is used, when and why.*

However, the guidance around how the technology *could* be used in terms of practice, appears scarce.

When asked **has technology allowed you to do something that you couldn't do before?** Teacher C suggests examples that begin to show ways in which a changing perspective on pedagogical practice begins to emerge. The three examples given below suggest implications for personalisation, differentiation and ways that renegotiate the dynamic between teacher and student in the class.

-Technology has allowed me to adapt my teaching to ensure the pupils have ownership of what they learn and when

- Using class notebook, I can identify a range of learning and the pupil's individual level and prepare resources to support their acquisition of that skill.

- this has enabled me to meet the needs of pupils who are resistant to a direct teaching approach.

The illustrations from the data are premised on the potential being somehow exclusive to technology but arguably, for the first two, it can be suggested that these underpin all effective teaching practice regardless of whether technology is used. It is in the third example that we witness the emergence of a changing practice as Teacher C suggests that an approach that uses IT rather than a didactic or direct form of teaching, would be beneficial for some young people. The suggestion here is that the role or function of the teacher in the class needs to be reconsidered as does the capture of how technology is being used outside of the class.

At the same time, Teacher C also sees that IT has far-reaching potential that may also change or surpass the role of the teacher. This is apparent in the following:

- *There are ways of countering people's opinion and outlets to voice off and broadcast that may have not been as easy previously.*
- *…brings about opportunities to connect with people that was not available before.*
- *I think teachers feel threatened in terms of their authority on the class and technology, or indeed access to the internet compromises their role as the person with the knowledge (or the all-knowing).*

The suggestion here is that technology potentially facilitates the access to information, in ways which may challenge the teacher's role. The following responses begin to articulate this position:

- *We must learn how this applies* [talking about Twitter] *as you may not need to know about a person or facts about their history if you can find it out or ask them directly.*
- *The way exams work, you need to be able to know the certain piece of information and then give it because in real life, young people might Google it or use a calculator to find out…*

Teacher C suggests that Google as an example of a ways in which young people now access information. This suggestion raises a question as to whether exams should be testing memory as in the past or other skills since Google can now provide the appropriate factual information. He suggests:

- *I can as do my students, 'Google' anything and there might be a link for it (mostly yes) this might be made up or one person's perspective, research, opinion etc. but the connection didn't exist so quickly or easily in the past.*

Whether technology provides a greater range of opportunities for the practice, content and also the relationship with how we 'know' something is brought into question in the following answer.

What are the barriers that prevent you from using IT in your teaching?

- *The speed of which technology develops means…we can do things that were previously impossible.*
- *Stream films, access a wealth of information at the touch of a button. Search through 100 millions sources in nano-seconds. This has major changes for how we know stuff.*

Teacher C's response here is interesting because he is now looking at the other side of the coin, since the questions of how we come to know stuff through IT seems to him to be something of a threat. Or that it may impede a more thorough or deeper knowledge that may be gained from traditional means. Teacher C continues in this regard as he suggests that technology has far-reaching potential that surpasses that of the teacher. This can be seen in the following.

- *There are ways of countering people's opinion and outlets to voice off and broadcast that may have not been as easy previously.*
- *…brings about opportunities to connect with people that was not available before.*
- *I think teachers feel threatened in terms of their authority on the class and technology, or indeed access to the internet compromises their role as the person with the knowledge (or the all-knowing).*

What is clear from these responses is that Teacher C is ambiguous in his understanding of the role of IT. On the one hand, he sees the great potential in it and on the other that it can challenge the role of the teacher as it has been previously understood.

Analysis of Teacher D's Responses.

Teacher D's response to the following questions indicates that the view taken of IT may be affected by age and awareness.

Has technology allowed you to do something that you couldn't do before?

- *I am able to relate to the students on their terms as this is their world not mine.*

He continues:

- *I think they* [students] *could teach me, as* [my] *career is very different to how it started.*

With reference to the volume and opportunities for information and how this is accessed and assessed he recalls:

- *I was teaching English which meant learn about set texts and then answer questions about them. Given the amount of information that young people have at their fingertips, it seems hardly worth it.*

Here we see the same issues being considered as those raised by Teacher C with respect to the speed of access in terms of information, so as such, set texts no longer seem relevant. The implication being that IT is changing the teacher's role and practices.

The tension between the technology and changing practice however, reflected in his response to the question: **What are the barriers that prevent you from using IT in your teaching?**

- *The way that young people assume that it is central to their learning is important as the world does not always need technology. It is OK to carry on as you were, rather than assume that because we have the internet this somehow should change the way teaching happens.*

He further comments that:

- *I think there is a time and place for technology and if you just accept that it happens like that out of school so it should inside you can lose the integrity and quality of your role as a teacher.*

It is Teacher D's use of 'should' in both cases that reminds us of Selwyn (2016a) and Cuban (1986; 2003) in his argument that the assumed potential of IT's impact on teaching and learning is incompatible with fundamental change to pedagogy.

The idea that technology can provide us with significantly more information in education than is traditionally available and how this relates to the formation and accessing of knowledge through a teacher is still under debate. Teacher D reiterates this point as he states:

- *How can young people know what they find on the internet is real, particularly with all the fake news being spouted.*

It is on this pertinent point that he sees a clear and perhaps decisive role for the teacher.

- *I think that you must teach the young people how to qualify the information they find or help them to connect it to others or make sense of it, otherwise the young people will get a confused message about their world. It is about being able to make sense of what they are exposed to and find through technology.*

Whilst the links between technology and access to knowledge must be made explicit for students through teaching, the overriding concern through the teachers' responses is that they too must be shown how to use technology. How technology should be used in new and innovative ways in the classroom requires detailed thinking rather than just assuming that its introduction will change practice. He is doubtful as to whether elements of the IT revolution should be taught:

- *The Government say that coding is important, but how this relates to real jobs I will never know. If I work in retail or at the butchers, how will coding help?*

Emerging from the teacher data is a gap between how technology is used for the purposes of administration, organisation, communication and the sharing of information, particularly for Teacher A and that of learning. That is, there is a concern with how to effectively manage the external administrative tasks required of the teaching process rather than to its use in the classroom. The engagement of technology to transcend traditional teaching and learning activities is then hindered by the use of technology for multiple administrative roles

which have increased as a result of the demands of accountability. So that while these teachers did not refer, as hypothesised in the earlier discussion to teaching to the test, nevertheless such testing is now closely related to keeping strict records. At the same time there are other factors that have restricted the innovative use of technology in the classroom: these include the problem of updating software, access to the Internet or connectivity issues, filtering restrictions so that students cannot gain access to undesirable material on the internet. All of these can cause teachers to default to traditional teaching methods, rather than to take risks or embrace new forms of pedagogy. The challenge here is that outside of the classroom, young people are seemingly more attuned and skilled with technologies which can cause teachers unease. Traditionally, the teacher would assume a dominant position in the class, and represent the collective knowledge that was to be transmitted to the students. Current practices acknowledged by the teachers point to differing sources of information and knowledge, which can challenge teachers.

These teachers' responses show that IT has raised unsettling questions for them in terms of their role. In this respect, we can see parallels between the changes we identified in the case of the Gutenberg press and the challenge to the role of the clergy, then, with the issues that teachers in this school are wrestling with. What then of the students?

The Students' Views

How the tension between the teachers' views and those of the young peoples' is explored in the following analyses of the Focus Groups. Throughout the analysis, the students' responses are included verbatim, without attention to their spelling, punctuation and grammar. This is indicated by the use of [sic] in the text. Additionally, reference to identifying names or places has been edited and is represented in the text as XXXX.

Analysis of Focus Group One

The first focus group as identified is drawn from a traineeship programme. These students spend a greater amount of time outside of the class when compared to the second focus groups. The significance of this focus groups is that there is an opportunity to explore whether the young people working across the 'world of work' and the classroom have a better developed understanding of how technology provides opportunities both inside and outside of formal teaching and learning.

The young people all have access to technology, this mainly takes the form of mobile telephones, tablets and laptops. The overwhelming way in which these young people use their technology is for entertainment and communication. They are quick to articulate that they use the Internet through their respective technologies to interact with others and share personal information.

In response to being asked **why do we have technology, what is it for?** They responded:

- *…to interact with our friends*
- *Facetiming*
- *Like, texting, calling, facetiming*
- *Twitter*
- *Facebook*
- *To play games*
- *Watch movies*

Also, the responses to asking how they preferred to use technology to communicate they quickly said texting but two young girls wanted to clarify that their preference was for communication by technology rather than face to face but this response was quickly

qualified with the following comment that acknowledged a changing priority for communication premised on the context in which contact was made:

- *Unless it is an emergency*

Here it was thought that a voice call would be more appropriate.

The focus on their use of IT seemed to be, as we have seen, on communication with friends and social circles and entertainment and communication.

These young people seem to have limited awareness of how you control audiences, limit interactions with strangers and maintain high security. Instead they default to accepting friend requests which allows strangers to view their personal information and photographs and to directly contact them on the premise '*I know how to block them, if it gets like, if I feel too uncomfortable…'.*

The limitations of safety awareness for young people also comes through when they explore the sharing of pictures and people 'liking' them. One young girl was keen to point out that *'I am not posting serious pictures up, I only post pictures, like, my dog.* This is in response to knowing that *'some people they just follow you and then they don't like none of your pictures*[sic]*…but some of them just like your pictures and are not even following you.*

These young people soon demonstrate that when it comes to technology, they have developed the skill-sets to use it identifying problems such as crashing and not loading up properly. Being conversant with the differing requirements and skills is important therefore. We can begin to see an example of this changing practice that incorporates two different skill sets as follows. When asked about preferences for interacting with strangers, the young people were quick to articulate:

- *Well, if strangers….*
- *Face-to-face*
- *Face-to- face, yeah.*
- *I'd probably do face-to-face, and then if it's someone I wouldn't' know, I'd always check their profile first.*

These responses recognise that the opportunity to use technology, in this context is not preferred. From their perspective, the notion that information presented on the internet, as

knowledge is problematic and echoes those issue raised by Teachers C and D about how information on the internet is understood or verified.

When asked **how you know what you see on Google is real or true?** The students were able to indicate a shifting practice for knowledge access and qualification. To this end, when challenged by the interviewer to consider how they might validate information accessed on the internet, however 'unreal' it sounds, the students responded as followed:

- *…that's obviously Google playing up.*
- *Look at Wikipedia….*
- *So you'd go to a different site?*
- *Yeah, but because we might not think it's true, but it's actually true because we haven't seen it.*

Their responses acknowledge that sometimes technology 'plays up' and can result in the necessity to question the validity and reliability of the information accessed. The suggestion then was made that the students could go to another website to see if there was consistency in the information presented. There also emerged a sense that videos were more reliable than written or spoken text. Yet, on this occasion, young people defaulted to their senses and perception by stating that in order to qualify as 'valid' information they needed to rely on being able to:

- *Actually hear or see someone…* [or] … *because the graphics might not be very good on it.*

Do these views reflect differing ways to distinguish, qualify and justify knowledge? In order to get a better understanding of the how practices in the class might change as a result of technology, the following questions try and ascertain what young people consider to be the purpose of school and the role of technology.

What are schools for? Why do you have to come to school?

- *To get an education*
- *Get you, like qualifications*
- *A head start to a new future*
- *Um, to be more independent*

To try to pinpoint a more detailed response, the following questions were posed to capture the specifics about lessons that young people liked. This aimed to re-evaluate the practical applications of pedagogy and then to consider how technology plays a part in this process.

When asked, **what would your best lesson look like?** The students responded with a selection of examples that indicate that not only is technology central to their everyday understanding of learning but further, that it represents something quite different from their experiences of learning in school.

- *Because most people's best lesson would probably be sitting down watching TV or going on YouTube or watching videos*
- *You do learn stuff when you watch films on YouTube because you get things that show the past*
- *You're learning stuff but not stuff that's more important than watching TV*
- *Go to town*

One student is keen to point out that if asked to choose between a traditionally knowledge-based classroom subject like History, and going out into town, she would choose History.

She articulates:

- *History, you know, teaches you things that happened before that you never knew happened…and you can use it for future reference….*

The details of how technology can provide opportunities to enhance learning were the basis for the following questions, which asked **how does technology let you learn? How can you learn with technology?**

The responses demonstrate that the young people can identify opportunities, but these are underdeveloped in terms of a detailed understanding.

- *Wikipedia*
- *Spelling*
- *It helps my little brother with his phonics*
- *The news*
- It tells you about what's going on in the world
- Apps

These responses are indicative of there being some potential in the opportunities provided by technology, but this requires greater attention and the links between their benefit and the learning being made explicit. Moving to consider technology in the learning discussion, the young people were asked, **does technology allow you to learn in a different way?**

A student responds quickly through reference to their experience of previously being in a mainstream school and the challenges this presented. He suggests:

- *Yes, because you're learning- you wouldn't have to go out- because in normal classes, um, if you was in a mainstream school students you'd have to walk around school* [from class to class] *and that for me, would be- when I was there it was really confusing for me…if you were a mainstream students and you just had a tablet, with a…whatever teacher on it, you'd just have to click on the apps...you'd have all those teachers in one place.*

This example is given importance because of the responses that that other students gave to this suggestion of not having to move around school and stay in one place.

- *But then you're not getting the independence or the help… you need, and you're not really interacting with other people then, because you're sitting inside.*
- *If you're actually talking to people face-to-face, then you know who you're talking to…*
- *Yeah it's better to, you know, cooperate and be together with other people rather than being isolated for a long time.*

This illustration is important as it demonstrates that there is still ambiguity in the students' views as to the value and role of technology in the learning process. This mirrors the teachers' responses.

The opportunities provided by technology are evident to the young people in the way it can help their interaction with others, they are also quick to counter this by suggesting that as much as technology mediates communication, it similarly causes challenges. Young people still appear to disassociate technology from formal learning (with the exception of watching YouTube). This comes through when the students are asked **do you think technology allows you to communicate with more people than you normally would?**

- *Autocorrect changes your words*
- *…it has led to arguments*
- *There can be challenges, by sending words*
- *When you talk to someone you can just say the word but when you're texting, sometimes spellchecker doesn't work so you have to think of the word, go on the internet, find the word, and then you need to remember to put it back in.*

What is interesting about these responses is that there is an awareness of the difficulties of communication through the written word and they also have access to the technology (spellchecker) to improve the accuracy of their communication through correct spelling.

Much of the focus in their use of technology is in social relationships. When asked **so, in real life, if someone's annoying you, what would you do?** A student's responses was to:

- *Just walk away from them*

But then she developed this answer to suggest

- *But with a phone, on texting, you can't because it keeps coming up on your phone.*

She was then able to consider how to respond, in a similar way to her 'real life' examples as she suggests:

- *But then you could just block them or turn the sound down.*

The challenges associated with communication are discussed by the students and they can identify that there are still differing approaches to how they undertake this in both face to face and IT spaces, and that there are differing skills sets that must be mastered in both. This view is mirrored in the articulation of the way that teachers perceive technology to require a change in their practice.

The young people discuss the way that using text and written communication can lead to misinterpretation and misunderstanding due to the lack of facial expression or emotion, which moved the conversation to emojis. In this discussion, it was clear that the students shared a different way of interacting and making sense of the world. Their responses became collective and when asked about the meaning of emojis and how this affected the accompanying written text in a message.

- *Like a crying laughing face-*
- *Which means?*
- *It's a joke*
- *ALL FEMALES: [general agreement]*

When asked how they 'know' how to do this, a student responds by saying

- *We're teenagers*
- *It's a way of explaining your facial expressions*

This distinction is pertinent as this is reflected in the teachers' responses that identify a different world as a result of the technology that young people inhabit. The counter-position represented by the young people is that there are elements of software they have appropriated and come to own, but as yet there remains a distance between their versatility and skill with new technology outside the school and its use in the classroom. The following responses that explore text-talk in contrast to formal English demonstrates how the students are conflicted by the differing priorities of everyday technology use and school learning. Despite previously acknowledging that their learning could take place outside of the classroom and use technology, such as video watching on YouTube.

- *So, do you find sometimes, if you write words, do you sometimes write text on paper?*
- *Yeah*
- *I* [use] *WUUT- what you up to?*
- *WUUT?*
- *Yeah, it's like a short way to spell 'what you up to?'*

When asked, **would you like to see us let you use emojis and text talk in school?** The students suggest:

- *It wouldn't be very formal ….*
- *No, I don't think-*
- *It just wouldn't feel the same, really.*
- *No it wouldn't*
- *…you don't' want to be sending, like, emojis, because when you grow up you might start thinking that you can send emojis in a formal letter, and then….*

In these responses they draw a distinction between their lives outside the school and the formal demands, as they perceive it of the school. Interestingly, they see the school as an education for the future, when they are adults.

Analysis of Focus Group Two

The second group are all full-time school students on a Study Programme at Sixth Form. This specific group of students was selected on the basis that they might provide greater insight into how technology applies to teaching and learning in class. The questions followed the same format as the first focus group and the group were of a comparable age.

Similarly, the second group are keen to illustrate the range of devices and ways that technology is used, but the responses are indicative of its use as entertainment, rather than formal learning. During the conversation, a student tries to clarify their preference for technology-based engagement rather than through traditional means, such as pens and paper.

Why would you prefer a computer?

- *Because it feels more relaxed*
- *Yeah, but it's more fun*
- *You can sweat out a lot easier*
- *With a PC you can change the way the game looks, the quality and textures and details.*

This distinction begins to illustrate the opportunity provided by technology, in ways different from traditional teacher-led pedagogies. The notion that the young person is the controller and able to adjust the experience to suit them seems important for some young people. The way that technology can enhance or complement a real-life or face-to-face experience is relevant when the students are asked **how many people communicate online….why is it useful to be able to do that?**

- *Not having to spend loads of money just to go and see them*
- *It's cheaper*
- *Its quick, compared to-*
- *Actually having to find a person [[and talk to them]]*

- *I think* [in reference to dating sites] *it's just as useful as meeting someone in person. Thing is, you could not just go around your local area and just knock on people's houses until you find someone that you like, that's your age and your similar interests.*

While this example is far from a class learning experience, its underpinning principles still stand. There is a way that technology can allow a student to undertake tasks and offer convenience, personalisation of expediency in ways that extend the range of communication. The application of this to pedagogy and learning opportunities is important as the following responses illustrate.

In what ways do we use the internet?

- *For research*
- *You could go onto Google, and, uh, type a question in and then there's other websites that might give you the answer.*

These responses remind us of the need to consider how information is qualified in the learning process as knowledge, which has traditionally been the role of the teacher. How does technology on this account, alter that process? The first step was to gauge the young people's understanding or truth and knowledge.

Do you think that the information on the internet is always the truth?

- *ALL: No*

This response was unanimous, but what was required is some insight into how young people will manage this understanding. If we can establish how young people use technology to access information, then this will support our understanding of how to revise pedagogical practice.

How would you be able to work out if it was true or not?

- *Like if you found it on more than one website*
- *Cross reference it with other things*

- *At the top bar where all the URL stuff id, if it doesn't have, like an http link, like, a www dot, I wouldn't really say it's official. I guess it's just like another pop-up, fake information.*

These responses indicate a need to consider further, how young people are supported to make sense of the world around them with current technology and echoes the issue raised by two of the teachers. There is an issue about how young people are able to question, critique and consider the information accessed in order to engage with knowledge.

Given the wealth of information on the Internet and young people's predilection in using Google as a consistent way of finding something out, there remains a necessity to support young people's perceptions of the internet as better or faster in accessing knowledge. What are the ways that young people are using technology and what impact might this have on learning practices?

- *Text their friends*
- *Social media*
- *Instagram*
- *If you're not a very strong person outside, and you're pretty techie, then you might be able to use the technology to hurt other people, whereas you couldn't do it in real life.*
- *…we've got quite a lot of people…who have autism, are autistic, and sometimes that can mean communicating with other people can be difficult.*

At the same time as they acknowledge the difficulty of communication, they also consider that the use of technology also makes communication easier, as one student said:

- *Thing is, is that, I've never really had a problem- the way I see it is that most people don't really have a problem talking to each other, because they're not exactly talking in person, and when you're having a text message, it's not like a real time conversation…you can actually choose when to end and start the conversation.*

The perception that by using the technology the conversation is no longer 'real' is interesting as it can highlight the requirement to support young people in understanding how technology is used for communication, but also the risk associated with its use and the

way that it can broaden interactions between people that may not be familiar with. Then we are presented with a declaration that the technology can increase autonomy over the conversation and provide an opportunity to decide when the conversation begins or ends. This has implications for how young people engage with each other both inside and outside of the classroom. How can we use this opportunity for greater autonomy to develop young people's learning?

If we return to the earlier comment regarding autism and the nature of having a learning disability, there appears to be a similar theme concerning autonomy. The following response suggests confidence and skill in conversation somehow amplified through using technology.

- *And also, when you're texting somebody else, you can take as much time as you need to reply back. Because I'm not standing right in front of you and I'm not thinking about what I need to say. I'm not being rushed to do it.*

To understand the young people's perceptions of how technology was being used the focus group was asked to describe **anything about technology that I haven't asked you before?** The responses indicate that there is still a relatively underdeveloped use of IT in formal learning and that the students' experiences of IT were still very process driven, such as the use of programmes like Word to create documents and Publisher to create assignment tasks.

- *IT is, like, very lacking. Because I know very little about computers and, like, files and stuff or, like, how to run programmes… that's the kind of thing we should be teaching here…how to run programmes and get things to work that you download off the internet…*
- *We don't learn, like, IT. We just learn how to use Word of PowerPoint over and over again.*
- *Once you know how to use PowerPoint, you know how to use PowerPoint, You don't need to do much more lessons making PowerPoints*

These responses mirror those of the teachers, in that they do little to move beyond the administrative tasks that support the organisation and planning of the learning activities, rather than the pedagogical aspects of learning. To try to consider the value of such

opportunities and to make a connection between everyday practices and the classroom the students were asked **what value would those new skills have for you, in your life?**

- *Well, working with computers. We're using computers more and more, so knowing how to work them…*
- *…teaching people how to use coding…in everyday life, it just like, it teaches you how to, like, develop commands and different animations.*

The acknowledgement that there is a link between their everyday use and learning is important, yet the detail was still limited. An attempt was made to draw out this connection further:

- *Well, I think that fact it's different, really. Like, for years, before computers, we all used to use books and stuff….and it took us so long to find answers*
- *Then you had to write stuff down.*
- *But what makes learning exciting now, is stuff like audible.com…if we struggle when reading books…or maybe you just don't like reading in general.*
- *Spellcheck and, like, writing. Your handwriting doesn't matter now, you can just type it.*
- *There are stylus on iPads and stuff…some people find it more fun to use technology to use their handwriting.*
- *When I use my laptop for my stuff…then I can just…look up the word I'm looking for, because sometimes I keep forgetting how to spell…if I want to text my mum or something, and I cant remember what to say, then I go on my laptop, go onto my Google, spell it out and it comes up…*
- *I use Siri quite a lot when I'm stuck or lost… I say 'Oh Siri, where am I?' and that tells you where you are.*

The recognition and move to using software to make decisions, such as weather planning, tracking oneself, predictive text to select spelling represents a subtle shift in accessing knowledge and information. When asked of technology, **does it give you the opportunity to not have to remember stuff?** The students were quick to respond that they can:

- *Just look it up on your phone, can't you?*

This question, is important as it begins to demonstrate that the sources of information that support access to knowledge are changing as a result of technology. What emerges from these focus groups is that the young people have developed new skill sets and new cultural protocols for interacting with this new technological world. It has enabled them to enhance traditional skills such a spelling but also to add new skills in the way they communicate. They are also clear that this technology gives them some autonomy in their communications. They can also think reflexively about the strengths and weaknesses of these different forms of communication as they can the sources of information they can take from the internet. Although they are less clear as to the warrant for such information or how to establish its warrant. There is a clear role here for teachers. Finally, they see the school as a very different more formal context, so that while they have learned new skills through their interaction with technology, they do not associate these with school work.

The final data set comes from the use of the OneNote programme. The programme allowed the students to return to the responses collaboratively in real time. The purpose of this process was to consider whether having this programme, as an aide memoire would support the development of more detailed responses.

Analysis of OneNote

The OneNote tool is a collective space that each student can access through their own device and work collaboratively. Whilst adding their comments, they are also able to see others' comments. The purpose was to test whether this use of technology would provide a more detailed response. The use also reinforces arguments made for additional processing time and prompts to support the understanding of young people with learning difficulties. The programme was installed on all devices used by the young people and was running in the background during their normal timetabled sessions. They were reminded at the end of each activity to revisit the OneNote page and consider whether they wanted to add anything in response to each of the following questions.

The students participating in the OneNote activity were the same students that participated in the two focus groups, plus three additional students that were absent for the focus groups but wanted to participate.

OneNote Questions

1. What kind of technology do you use?
    a. Where do you use them?
    b. What do you use them for?
2. Describe how technology helps you out of school.
3. Describe how technology helps you in school.
4. In what ways could technology be better used in learning?
5. What are the challenges of using technology?
6. Has technology allowed you to do something that you couldn't before?

In exploring the different technologies used by students, we can observe that every student owns at least one device. These range from fourteen young people using mobile phones, 14 students using a tablet device, five using a gamin console, eleven using PC or laptop and one using an EchoDot device. This demonstrates that there is a broad range of devices familiar to the young people that inform their responses. There is an even distribution of home/school being cited as the location for the technology use, but interestingly, nine of the students use their device whilst travelling and on trips. The majority of these uses are consistent with the responses that acknowledge entertainment being the primary use. This involves accessing video, music, watching TV and listening to music. Seven of the young people identify communication through social media, texting or FaceTime in their uses.

When asked to **describe how technology helps you out of school** the following responses identify a changing way that young people access and make sense of their world, thus representing a changing understanding about how they access knowledge.

- *I use th* [sic] *internet to find out things that I can't have in school.*
- *The teacher only knows what it says in books and in the units. The web is better as its updated.*
- *…calling people if I need help.*
- *I can take pictures of things that I don't understand and ask my mum or teacher what it means instantly.*
- *I text my friends, this means that I can say more than I would using my voice.*
- *I can spell better…*

- *If I get stuck I can search it on Google and find difficult words.*
- *…take photos, set alarms and reminders.*

The use of technology to mediate gaps in knowledge or to develop autonomy over learning is subtle, yet this is indicative of new opportunities arising through the development of technology.

The third question asked students to **describe how technology helps you in school.** Responses here indicated a preference of working through technology as it allows students to be more confident and to be able to work in ways that face-to-face activities cannot provide.

- *I am more confident when using technology as speaking to people face to face is hard.*
- *If we were using a poster to make then this would be hard but if we work on onenote collabortive* [sic] *page then I can see what he is working on and then this will help me to learn and think abiout* [sic] *things like he s triggering my mind. If we work together on a poster I think that I don't want his help but on onenotei* [sic] am happier.
- *I am able to develop a persona, I am not confidengt* [sic] *in real life.*
- *Things are quicker with IT. It is the way the world works but school is not like this.*
- *It helps me of my learning. I can check answers and share my work quickly.*

These responses are indicative of ways that technology can bring about alternatives to traditional class-based learning activities that have been premised on physical proximity and group work. It enables them to collaborate and interact in different ways.

Question four asks young people **in what ways could technology be better used in learning?**

There is an emergent frustration that technology is providing new ways to generate content with regard to classroom activities but there remain barriers, such as assessment, examination and financial activity.

- *Let us use the computers to do exams, wen* [sic] *we use it it is to make word documents or powerpoints, we can use this for exams, only make paper documents and print them into file.*

- *It would be good to have individual computers or iPads asi* [sic] *as I can work quicker with computer as writing is hard and the way that I like to learn means I can check things with friends and share stuff quicker than in class.*
- *In my functional skills exams I had the speaking and listening exam and it was pretend speech and presentation to people. This makes me embarrassed and I did not do well. In my real life I speak to millions of people online and face to face. Why can't I just record me talking to people in real life and send that in, or they could see me using skype this is till talking to people but in reality rather than pretend.*
- *We only really use it to create documents... in life technology is central to how we do stuff rather than create documents.*
- *Teachers don't know as much as Google does, there is more knowledge outside the classroom. If you ask questions about using technology or the world, sometimes the teacher doesn't know. We have to use the internet together to find out.*

Whilst crude, these examples illustrate that a revision of the role of the teacher and student may support the observations and responses of the young people. Yet, how this is maintained whilst adhering to institutional and governmental policy and socio-political demands is problematic.

In order to understand the tensions identified by the young people as a mechanism for revising practice, the fifth question that asked **what are the challenges of using technology?**

- *You sometimes come across information which is false and you don't know if it is or not.*
- *…internet speed is poor, the filter system is patronising…*
- *…update means stuff moves on your pc or phone…*
- *You cannot always know if what you read is true, so you have to check it from othe rplaces* [sic] *and then teacher.*
- *Note being allowed to use this in sessions.*
- *We need to be shown how technology can be used to help us learn in all our sessions not just IT. I am suing it everywhere and this is noit* [sic] *the same in school, the teacher makes us use IT to complete workbooks and then print for portfolio. This is not the 21st century.*

- *Sometimes the teachers don't know how to use technology.*
- *You must answer question using pens and paper which is old fashioned.*
- *In my English exam I had to write a letter but I don't do this really. I would send an email of* [sic] *facetime someoine* [sic]. If I want a job I can do this applying online now.
- *I know more than the teacher does with IT.*
- *You have to remember different ways of working with PC/laptops.Ipad and phones.*
- *Ipads don't share work with PCs well.*
- *I can't use my phone to find the answers to questions but in town I would if I needed to know something.*

These responses illustrate a frustration between the potential capacities for technology on the learning process but similarly mirror the challenges identified by the teachers in that this requires careful planning and consideration and training to engage technology successfully in the learning process. The distinction between written forms of assessment and that which employs new technology is also contentious, particularly if the skills being developed are truly functional, the question remains, for whom?

The final question sought to capture new capacities and skills that technology is beginning to provide. The intention here was to consider the specific impacts this might have on the teaching and learning that happens in the classroom and act as a point of reference for planning.

Has technology allowed you to do something that you couldn't before?

- *Google translate means I can speak lots of languages.*
- *If I am lost Google maps to help me get home.*
- *You get information in an extremely fast way.*
- *I can chat with people in different countries.*
- *I don't have to remember phone numbers any more.*
- *The computer can read work and websites to me.*
- *I can work in a café as the jobs I need to do are on a schedule and I can watch videos to show me.*

- *I can take pictures of things I need to remember.*
- *In onenote I can record my answer with the video recorded as writing can be hard.*
- *Quicker than going to the library as books are difficult to read.*
- *I can tell the teacher that I don't understand and they can help me without other people knowing.*

Summary

If we place the responses by teachers and students within a broader historical context, then there is a degree of uncertainty in the understanding of the teacher and student's role with respect to the potential that technology may have in enhancing learning. Teachers have a range of concerns as to their changing role with respect to technology, while students have a definite view that school is a different social context to their world outside. At the same time, students are developing a set of skills that are relevant to their learning. However, one key point which seems central to the teacher's role and will remain so is that of enabling students to distinguish between warranted claims and what some of the students called 'fake news'.

Chapter 7. Conclusion and the Practical Application of Key Findings.

This concluding section revisits the original research questions in light of the analysis and data and looks to consider, to what extent we are able to better understand the current context for how and why technology is being used in teaching and learning.

This thesis set out to consider a series of research questions through an analysis of the history concerning the inception of the Gutenberg press and its impact on changing social practices. Such changes were evident in the role of clergy and the way that traditional church practices, such as transcribing holy doctrine for transmission or delivering sermons were superseded by printed texts. We were also able to see how people from different cultural and social backgrounds increased their social interaction with each other in order to access new forms of information, such as the printed book.

Following the example of the Gutenberg press, this thesis then sought to assess whether there were parallels that could be drawn with new technology today in relation to pedagogy and learning. The historical dimension is important since if we are in the middle of another technological revolution, then we need to appreciate the length of time and social adjustments involved before technology can be used for innovative forms of pedagogy. If we use too narrow a focus, what may appear to be a particular problem, of say, the training of teachers, or the lack of IT will not be remedied simply by training teachers to use particular IT platforms. Rather, the historical example suggests that a wide range of social changes was required to make full use of the technology that Gutenberg's press enabled. A broader social and historical understanding is required to address the paradox between the introduction of new technology into the classroom and the view that they have had little effect on learning.

Of importance to this argument is Cuban's (1986) identification of *System Issues* by which he refers to the ways that technology is enforced on teachers. The problematic adoption of technology in the classroom is a part of a conflict between the compromising of a teacher's art and craft in terms of their role, and the compliance which is demanded by the state in relation to pedagogy, the curriculum and assessment. Here policy makers encouraged by corporate salespersons have seen technology as a means of gaining teachers' compliance. This tension is still evident over three decades later. In the twenty-first century there are

still echoes of Cuban's (1986) findings in the voices and views of the teachers in this study. The demand upon teachers to use technology in their practice is perceived by them to, either question the autonomy and authority of the role of teacher, or to make their role problematic. How then can we best understand the relationship between technology and the learning process?

One way to elicit a new vantage point to this discussion is by talking to young people. Both Selwyn (2014; 2015; 2016a; 2016b) and Cuban (1986; 2001; 2003) omitted the perceptions and voices of young people in their work. This thesis signals the individualism and changing nature of social interactions and communities identified by the young people as central to understanding the role of technology and it potential uses.

The next section seeks to unpack this tension and to do so in the context of the way young people now interact and communicate through technology. Each research question is taken in turn.

The research questions were as follows:

1. What can we learn from the historical example of the Gutenberg press about changes in practices and dispositions that can be used as a guide to further investigation of the uses of new technologies to enhance learning?
2. In what ways do teachers and students use technology in learning?
3. What do teachers and students tell us about their use of new technology inside and outside school? Are their views helpful in helping us understand how technology can be employed to better enable learning?
4. Is there a gap between existing pedagogical practices and what we might expect of technology in enhancing student learning and practice?
5. Finally, can these explanations lead to enhanced learning?

The Use of the Historical Example of the Gutenberg Press

What we can learn from the Gutenberg example is that it enabled major changes in the authority relations of the Church and subsequently the state and in the roles of clergy and lay people?

The culture of the fifteenth century Birkerts (1994) argues, was primarily oral and was dominated by religiosity resulting in a centralised power bestowed by the conduct of the Church. Educated, (albeit able to read) clergy were held on high by the laity whom were generally illiterate workers indebted to the Church as the centre of community, receiving both moral and spiritual guidance and the material means to survive. The laity did not work for the Church in ways that we would currently consider occupational, yet the relationship between church and its people was central to the lives of lay people. The result of such a church-dependent position meant that access to information was controlled by specific groups of people. Here there is a parallel to be drawn with the role of teachers and students. The notion that there is pre-determined information to be transmitted to others, against which they will be assessed or judged is equally observable in current classroom teaching. The transmission of curriculum, testing and assessment are all reminiscent of the dynamic illustrated in the fifteenth century. The impact of the technology on both accounts is significant. In the fifteenth century it has been argued that it strengthened the hand of lay people whereas in the twenty-first century, the situation is much more challenging. It is not clear whether the rapid accessing of information by students will or should change the authority relations of the teachers. In historical terms, it seems that we are still early on in terms of twenty-first century technological development, which might help to explain the current tensions between pedagogical theory and practice.

Technology and Time

The issue of time, is significant as this features in both the historical analysis of the Gutenberg press and also in the discussions with young people. We have established that this is not a case of simply adding more IT to current practices, nor is this simply a case of more training for teachers. By using history, we have been able to demonstrate the complexity of the changes afoot, particularly with regard to time. The speed of impact and some of the resultant changing social practices, as a result of the Gutenberg press, were not

apparent for nearly one hundred and fifty years after its inception (Builder, 1990). Is it appropriate on this account to assume that the introduction of new technology in the classroom will that can promote learning takes time and as such, this is just part of the embedding process?

Technology and the Rise of Individualism

Young people are demonstrating that they feel a sense that technology allows them to develop their sense of self and the way that they present themselves by giving them autonomy in how and when they communicate with others. It is here that we can see the beginnings of the development of a new set of protocols of communication and cognitive and emotional engagement between young people. The question that arises is whether new technology is giving extra impetus to the development of individualism. When we read young people's views as to how they can best communicate, it would seem that this may well be the case (Pierce, 2009). If so, it seems that we are observing a changing sense of self amongst the younger generation with which educational policy and technology has yet to catch up.

That said, we have also seen that young people draw a distinction between their lives outside of school and the classroom which they see as formal and linked to becoming an adult. From this position emerges a sense that while they view technology as facilitating entertainment or play, such play is not appropriate in the formality of learning in the classroom. This suggests a gap between the different uses of technology within and without the classroom in their perceptions.

However, it can be argued that their perceptions may lead to a lack of potential in the way technology could be used in learning. Technology enables opportunities to collaborate, interact and engage with people across continents, time zones and cultures and with a few clicks or swipes, the rapidly connected network society (Castells, 2009) is evident. Connecting with people multimodally, and engaging, sharing and co-constructing knowledge to make sense of this new world is common place for young people outside of the classroom (Tapscott, 2009). This suggests that the gap between the perceptions of students and of teachers could be beneficially closed by ensuring that young people are able to access and where appropriate contribute to this world and possess the knowledge and skills required to

do so. Here, the pedagogical challenge is to link the everyday experiences of young people with disciplinary knowledge in the terms set out in Young (2008; Young et. al., 2014; Moodie, 2016).

In What Ways do Teachers and Students Use Technology in Learning?

The first question sought to explore how teachers and students were using technology. From the analysis, we can recognise some ambiguity among the teachers in the study. There is a focus on *how* technology can be used for administration rather than learning. Consideration of the way that technology allows teachers to complete their administrative role in faster or more efficient ways emerges. This attention to increased access, connectivity, and communication does little to consider the potential impact for the learning activities of young people. From a pedagogical perspective, the uses of technology by young people has a similarly restrictive view as to *how* it can be utilised for learning in the formal context of the classroom. Nevertheless, they do use it in developing different forms of communication.

While opportunities for accessing entertainment seems to be highly valued by young people they do acknowledge some subtle shifting capacities and practices that could lead to a change in pedagogy. The students' responses are concerned with being able to access different forms of information; the extent to which this could impact on learning is significant.

There is also an indication of technology-use being concerned with how young people are making sense of their world around them and their understanding and projection of their sense of self. Examples of this include being able to use 'Siri' or Google maps to quickly identify the young person's location and subsequent journey towards a destination. Equally, the way that young people with autism have identified that they can take photographs of items, situations and challenges and seek counsel electronically through contact with parents or friends could be of pedagogical significance. To be able to identify specific opportunities for pedagogy is a theme that emerges on two-levels, it reminds us of the illustration at the start of this thesis regarding the introduction of iPads in school without a consideration of how they might be used in pedagogy and further, that there remains a distance between our understanding of technology and its implications for learning.

To be able to identify specific opportunities for pedagogy is a theme[1] that is explored in research questions two and three.

Is There a Gap Between What We May Expect of Technology in Enhancing Student Learning and Practice?

By asking if there if there is a gap between what we may expect of technology in enhancing student learning and practice, we are able to ascertain how we might move forward. The central theme that emerges in response to this question is a tension between the barriers teachers perceive in their use of technology and a sense from young people that the formal way in which they view the school makes it *'off-limits'* to technological innovation. The ways that some of the teachers describe factors that prohibit the use of technology, indicate that there may be other pertinent considerations, such as the use of filters for blocking undesirable content, which have influenced their views but which, as one student described it, was from his perspective, patronising.

If There is a Gap How Can We Best Explain It?

The reluctance of teachers to use technology in their practice is problematic. We have noted the hesitation of teachers to use technology, because there is an underlying tension concerning their authority. This tension is premised on the teacher's role in being able to assert and exercise authority over learning activities, resources, and practice, whilst still being regulated to some extent by policy: one that Cuban (1986) first articulated. Therefore, if teachers are not leading the use of technology because as some observed, students were more proficient in technological use than they were, then what does this say to the young people about the potential role of technology in learning?

1

To be able to identify specific opportunities for pedagogy is a theme that emerges and is pertinent in a recent study by The Organisation for Economic Co-operation and Development (OECD, 2015).
The OECD (2015) report suggests that through their international study of technology use and the Programme for International School Assessment (PISA) tests, there appear to be no '*appreciable improvements in student achievement in countries that have invested heavily in ICT'.* (p.3). yet, they are keen to draw inferences from the evidence for why this may be so. Without a revision of technology's impact on learning practices, they argue, what results is a dilution of potential, brought about by simply adding twenty-first technology to twentieth-century practice.

Can This Lead to Enhanced Learning?

The potential for opportunities for enhanced learning, feature in the final research question, yet, as has been shown, we are still not able to fully realise these and exploit them in learning terms. The salient points emerging from the data suggest that we are left with the following challenges: The expectations for technology are unrealistic or ambitious; appropriate policies and pedagogies are under developed and that given a relatively short time scale, in historical terms, it may be that this can explain limited connections between policy, practice, teaching and learning with respect to new technologies.

Having teased out the tensions and explored the challenges between theory and practice, the following section attempts to articulate a way forward. How then do we begin to systematically reconceptualise the role of technology in learning? There are four areas for potential development that emerge from this enquiry. These are the identification of changing *relationships* between young people, their peers and teachers and also with information. The potential for *new information sources* that suggest ways, previously not available, to access and share information. These two themes lead us to the final two, a changing *sense of authority and autonomy* that applies to the role of teacher and student, but also of how policymakers respond to these changing times. These changes result in the ways that people are now making *sense of the world.* It is here we see new opportunity for specialised information, continually updated information, 'real-time' access, multiple formats of platforms for collaboration and access that requires active participation. Given what has been said about the complexity of change and the time needed for technology to be embedded to be fully utilised, it should be said that the way forward outlined below does not underestimate the difficulties involved. Yet, pedagogical change will only occur if we take the first step.

Summary

This research has found that there are several reasons as to why teachers are inhibited in using new technology. These include: a concern over their competence in using the technology in the classroom, as opposed to administrative purposes; a concern to exercise appropriate control over what is accessed on the internet by students; and most importantly, given the historical background established through the analysis of the impact

of the Gutenberg press, a concern about the changing nature of their role, and in particular the basis of their authority, given the access to information that students can now have.

Not all teachers all expressed the same concerns. At the same time, two of the teachers saw a key role in enabling students to distinguish warranted knowledge and claims from those that were.

It is with the students that we can see a more profound impact on the way technology has changed their forms of communication outside the classroom. This has given them potentially more autonomy in how and when they communicate, and they have demonstrated sophisticated skills in their use of technology and the new norms by which such communication takes place. Some of these skills are clearly helpful in the classroom, for example they referred to spell checking to ensure that could communicate appropriately. They also discussed how they would know whether the claims made on the internet had warrant. What was surprising is the distinction between their forms of communication and use of technology outside of the classroom and inside. Here they seemed to draw a strong distinction between 'play' outside the classroom and the formal teaching, to enable them to become adults, inside the classroom. It was noted earlier that the literature on the role of technology in learning, referred to in Chapter 2, had not studied the views of students. In this sense we can see that the gap between the promise of technology in learning and the reality is not only because educational policy and teachers have been conservative in this respect but that students are also.

In terms of my own school, we now have a series of explanations as to why it has been slow to use technology for pedagogic purposes, even though it has been designated a technology school. What is evident, is that we need to move beyond using ICT as a tool to continue traditional pedagogy and use technology to support young people and teachers harness, evaluate and then synthesise information from various sources. The main themes however, in the literature, do little to show us how to move forward.

The following provides a starting point for reconceptualising how we might move from theory to practice and maintain systematic and realistic expectations for technology in teaching and learning. It acts as a set of questions and points of enquiry that begin to tease

out the way technology might impact on classroom practice and to act as the basis for actively considering the subtle changes in pedagogy.

A Way Forward?

Changing Relationships

In this context, the relationships can refer to the students and teachers in a classroom setting and similarly, the relationship between young people and their learning. It is important that the roles and expectations are discussed thoroughly in advance and this is because, as we have seen both the roles of teachers and students are being changed by new technology. How are participants expected to interact in the classroom and then on a wider, global scale? How are the ways that young people use technology to interact and foster relations being used to the advantage of the young person and teacher in the classroom?

A Shifting Sense of Authority and Autonomy

This theme concerns the roles adopted by teachers and students in formal learning activities. Whilst this is not a macro study of revising assessment of learning or educational policy, it does attend to the changing practices that occur in the classroom. Traditional pedagogic activity is premised on the teacher as the leader of the learning process. However, as we have seen from this study, the nature of the teacher as an authority may well now change (Kellner, 2004). The teacher is no longer the repository of information because that can be gleaned from the internet. However, some teachers and students raised the question of how knowledge claims on the internet could be verified or seen as warranted. It is here that the teacher's role may now change. Students need to be taught to distinguish 'fake news' from warranted news or knowledge and here their role as an authority remains of significance.

Moodie (2016) explains the lack of progress in the pedagogic use of technology, in part, on the importance of the teacher or university lecturer in inducting students into disciplinary knowledge. The point being made here is similar in teaching students about how to identify warranted knowledge. At the same time, it may be that the teacher's' traditional authority relationship can also be re-framed by students who may have greater skill and facility in using new technology. Illustrations of this potential opportunity for a change in the

pedagogic relationship between teachers and students in using technology can be seen in the current exploration of talent recruitment in transnational organisations (Lauder. (*pers. comm*.) 14/10/2017). On this account, we see businesses benefiting from technology, but this is as a result of the shifting role of young talent in supporting the learning about technology of their senior managers. These examples suggest a continuing and a changing role for both teachers and students in the classroom.

The impact of this suggestion is that the teacher now recognises that at points in learning activities they will not be in control or 'in charge' and use this as an opportunity to broaden leadership skills for the students. The overt benefit of this shift is that the learner begins to adopt and develop leadership qualities.

Making Sense of The World

The transformation afforded by new technology does more than just provide new ways to engage in communication because it provides new possibilities that require a changing understanding of the self in relation to others. These changing communicative practices require differing skills and understanding, which young people need making explicit in their learning. We have seen from the students' responses in this study how they are aware of the skills needed to negotiate these new forms of communication and how it can change their sense of self to the point where they have greater control over their communications. The social nature of these practices is premised on the collaboration and active engagement between different people, and as such, require of young people the understanding to navigate additional spheres beyond face-to-face interactions. The collaborative nature is pertinent to teaching and learning as it may indicate how technology can change the transmission of information into a more active alliance. Barton and Lee (2013) summarise the impact of the shift in practice as '*…a focus on the facilitating of participation and interaction, with the result that the 'content' of what is developed and shared on the internet is as much a product of participation as it is of traditional creative and publishing/broadcast processes.'* (Barton and Lee, 2003, p.3).

Limitations of the Study

There are several limitations that can be pointed to. The first is that this is a study of the teachers and students in the sixth form in one school which is a special school which is also

a school recognised as having technological expertise. The research now needs to be extended to other schools to ensure that the findings of this study can be replicated. There is also a question of whether the students' views in this school on communication with their peers also applies to students in non-special schools. For example, the students in this study found that face to face communication could be difficult. Does this apply to all students of the same age? In is noteworthy that mainstream school students have also expressed concern with face to face communication (Pierce, 2009). Caution needs to be attached to the conduct of the focus groups. In Chapter 3 the critical role of the interviewer was raised. The transcripts of these focus groups are supplied, and it would be for researchers in this area to judge how impartial these interviews are. With respect to the teachers, the open-ended questionnaires yielded quite rich data but in further studies, interviews in which teachers could elaborate on the views they have expressed in these questionnaires would be helpful, to understand more about the way technology is challenging their traditional role. It is hoped that the data and issues raised in this study are sufficiently rich for further research in this area to be undertaken.

Concluding Thoughts

This study has sought to provide parallels between the influence of the Gutenberg press and that of the new technology. What we see in the case of the new technology are some emergent elements in terms of changes to pedagogical authority and the role of teachers and students.

Change, as has been argued throughout this thesis take time and requires much broader adaptions at all levels to be effective. Such thinking requires a major commitment from a range of agencies in education. Gutenberg's technology, through increased opportunities for interaction and information sharing, supported and changed the relationships between members of congregations, industry, schools, learning communities and institutions. In the voices of the young people we begin to see the emergence of a changing sense of self, both in individual and collective terms.

Digital technologies should enable agency and act as catalysts for change on many levels. Whilst the expectation might be over exaggerated or ambitious, what is evident from this

study is that both teachers and students consider that their roles are being challenged. Teachers are aware of this challenge, while some of the students seek to make a strong distinction between the formal context of the school which they associate with learning to become adults and their private use of technology. The field of learning is currently in a state of flux and as such, technology is being cast as central to this revision. Young people hold in their hands such opportunity in the form of digital technology, which is under-utilised in the classroom for the reasons provided in this thesis. Maybe finally, we can now begin to understand the possibilities by which young people can come to expect opportunities that have been, until now, unimaginable- now there's a thought.

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Appendices

Focus Group One- Transcript Anonymised.

TRANSCRIPT GROUP ONE

I: Right, there we go. I think we're recording. So, we said we would talk about technology and how different people use technology. How many people in this room have a mobile phone? One, two, three, four, five, six, seven, eight… everybody has a mobile phone. How many people have got an iPad or a tablet at home? One, two, three, four, five, six, seven. So, eight for phones. Seven. Who's got a PC at home? Four. Who's got a laptop at home?

F1: Does a netbook count?

I: Is a netbook like a tablet, like a Kindle or a—

F1: A tiny little laptop.

I: Yeah, absolutely. So, that means everybody. Who has other technology at home that we haven't talked about, so far? **XXXX**, what do you have?

M1: PS4—

I: Yeah, and?

M1: Smart TV.

I: A smart TV, exciting.**XXXX**, what have you got?

M2: PS4, um, screensaver TV.

I: A screensaver TV. What does that mean?

M2: It means that if the TV's on for a long time it'll burn up the screen or something—

F1: Oh, and turns it off itself?

I: Oh, okay, so a clever TV that turns itself off?

F1: Mine's a Samsung TV.

M2: No, it doesn't really turn itself off, but, I think it's. Don't know, but also have technology like Xbox, and –

I: So computer consoles as well?

M2: Yeah.

I: Excellent. Okay, let's have a strange question. Why do you think you have technology? Why have you got the technology that you have? There's a hard question to get you thinking. Why have you got technology?

F1: Um, to interact with our friends or…

I: To interact with friends? How do you interact with friends? Who has an example they could give of interacting with friends? Go on then.

F1: Like, texting, calling, FaceTiming—

F2: Skyping.

I: FaceTiming, Skyping—

M3: Facebook.

I: Facebook.

M3: Twitter.

I: Twitter. Wow, okay. Uh, how else do you use technology? How else do you use technology in your house? Any examples? You've got lots and lots of technology. How are you using it? Does it just sit there not getting used? I've got a sandwich toaster, I've got a blender, I've got a smoothie [maker], they don't get used. They sit on my side in the kitchen collecting dust. How do you use— yes?

M3: To play music.

I: To play music, and how else do you use it?

M3: Play games, watch movies on—

I: Play games, yeah. Play games, watch movies. And you said you used it to communicate with other people? How many people in this room use the telephone to call people, with a voice call? No one?

F1: I leave voicemails, I do.

I: You leave a voicemail for people. So, if you had a choice to call somebody on voicemail or send them a text, what would you prefer?

F1: Text.

F2: Text.

I: Text. Is that everybody?

ALL: [general agreement]

I: Yeah?

F1: Unless it's an emergency, then I'd call.

F2: Yeah.

I: Emergency? Excellent, okay. Do you think the way you use technology in school could be better? Could we use technology in school in a different way, or in a better way? Think about things we don't do in school that we could do. Ooh, everyone's gone silent.

M1: [[Yeah, I think so, yeah.]]

F1: [[Yeah, I think we could, but—]]

I: Okay. How? How can we use it in school?

M1: You could have, like, you could have a screen in the office, sort of like a hub, that connects to every device. I've got one at home, and it's meant to connect to every device, and you see what people are doing. So, say you've got a camera. You've got, like a, sort of like a screen, um, and you can see what that camera's looking at. So you can see what's going on in that area. So, if you just say, if you had a camera in the primary area, you could see what's going on, um, and if there was an electric door that could be controlled by that certain screen, and that screen was in reception, then it wouldn't have to be closed manually. It could be closed electronically, like, back gate.

I: What do people think about having cameras in school, to watch what you're doing? **XXXX**, what do you reckon?

F4: I think it's a good idea.

I: Would you like to have a camera in this classroom [[to watch what you're—]]

F4: [[No.]]

ALL: [general disagreement]

I: No? Why not?

F1: Um, it makes you feel safe, but I wouldn't want a person watching me all the time.

F4: Yeah.

I: So, it makes you feel – what does it make you feel safe from? Does it mean that when you're at school you don't feel safe?

F1: I do feel safe but I mean, like…

M4: Too many cameras lying about invades privacy.

I: Okay.

F1: It, like, makes you think you're in prison.

I: [[makes you feel a bit—]]

F4: [[Yeah.]]

F1: How many cameras is looking round at you all the time, like, people might think you might steal stuff, and they might keep looking at you and you see the cameras moving and…

I: It'd be a little bit like Big Brother.

ALL: [general agreement]

M1: I'm not saying it has to be like that. I'm saying, like, it could be for reception use only, so, say instead of putting in a code you could just look at a screen and see who's at the door.

I: So it'd make things faster, maybe?

M1: Yeah.

I: And easier?

M1: Yeah.

I: So you could let people in from reception without having to be—

M1: Yeah, with facial recognition.

I: Oh, with face recognition, okay. So, without having to be there, you could do that?

M1: Yeah. So instead of having to type in the code, and if it— the camera would only recognise people that it's allowed to recognise. So, if it's someone like us, it would only allow us through, not people in primary or secondary.

I: Sounds a bit like James Bond, doesn't it? I like it. I like that idea.

M1: [laughing] Not entirely.

I: So, you've said that you use technology outside of schools and you've got lots of different examples. You're said FaceTime, Skype, text, e-mails, uh, Facebook. Twitter. How many people in this room have a Facebook account? One, two, three, four, five… How many people in the room have got Twitter? Two. What other ways are you using technology to communicate with each other? I'm very old, so I don't, obviously, understand. What else have we got? Is there, Insta—

F4: Instagram.

I: Who's got an Instagram account?

M1: I used to.

I: What's it for?

F1: Um, taking photos.

I: You use it to take photos?

F4: [[You can make—]]

F1: [[To see what people are up to.]]

I: To see what other people are up to, and to talk to people? So, how to you— I don't know how it works. Tell me how it works.

F2: Uh, it—

I: So, I've got my phone—

F2: Yeah. Uh, like, you have, if you've ever been onto Facebook, you have your own profile, but instead of, like, having friends, you have, like, followers.

I: Okay.

F2: And you can follow them back if you want, and, um, you just, like, post pictures and, uh, you can talk to people as well, like, you can make chats or you can talk to them privately, like, uh— yeah

I: So, what would you prefer? Do you prefer talking through something like Instagram or Facebook or Twitter or Snapchat, rather than meeting up?

F4: No, I—

I: Is it easier?

F4: Meeting up.

All: [Meeting up.]

F1: Meeting up's probably the best, but if you're a long, long way away from eachother.

I: [[Yeah, prefer meeting up.]]

F2: [[I prefer meeting up]] but—

F1: But if you obviously can't then it's just like, good that you can talk to them on text.

I: How often—so, let's see, how many people do you think you speak to each day on social media or on technology, rather than face-to-face?

F4: Not many.

I: Do you think you speak to more people face-to-face than you do with technology?

F1: I speak to more people face-to-face—

ALL FEMALE: [general agreement]

I: Guys?

M1: Yeah, I do the same.

I: Yeah?

M2: Yeah.

I: Yeah?

M3: Face-to-face.

I: Sometimes, if you're using technology to talk to people, are there problems? Do— do you get into— are there issues and things that happen using technology or texts or Snapchats or Instagrams, or those sort of things?

F1: We do obviously talk about problems, don't we, sometimes?

F2: Uh-huh.

F3: Sometimes.

I: So you share problems—so, would you share problems— is that with people that you know?

F1: Yes.

I: So— Go on, what were you going to say?

F1: Um, only people we know, not total strangers that we don't know.

I: So, on Instagram, if you've got followers, does that mean you know all of your followers?

F4: No, it's not all of them, no. You don't have to follow them back. You can block them. If they start pestering you or they start liking your photos and you don't really want them to.

I: So, how many people have Instagram?

F1: I only follow the people what I know, I don't follow any strangers, I don't.

I: Does anybody follow you that doesn't know you, that you haven't met in real life?

F1: [[Probably quite a lot—]]

F4: [[Yeah, I've got a few,]] but I don't' follow them back.

F1: I don't follow them back.

I: So, what do you think about the fact if you send a picture of yourself and they've got it? How does that make you feel?

F4: I don't know—

F3: I don't exactly think of that.

F2: No.

F1: I am not putting serious picture up, I only just post pictures of, like, my dog, pretty much. That's the only one I've posted.

I: Your dog's famous now on the internet. Everyone knows your dog. You said you didn't really think about it, didn't think about them actually being able to look at you.

F3: Well, like, some people they just follow you and then they just don't like none of your pictures, do you? I've realised that. But, like, some of them just like your pictures and are not even following you. But, I just, it just don't bother me if I know how to block them, if it gets, like, if I feel too uncomfortable, so…

I: Where do pictures go when you share them? Do you know?

F4: It just goes on our page, doesn't it—

F1: It doesn't go onto the internet or nothing like that.

I: It doesn't? You don't think it goes onto the internet, no? What kind of problems have you had using technology? Have you ever got into arguments, fights, misunderstandings? Not being able to get your message across? Frustrating? Any kind of— has it all been perfectly easy, perfect. Never been a problem?

ALL: [general disagreement]

I: It's not all been perfect? Oh dear.

M3: Well, the reason I shut down my Facebook account was because it was taking up too much of my time. It was getting too addictive.

I: Okay. So, you were using it more than what, going out or doing other things?

M3: Yeah.

I: Um, how many hours do you think you were using it?

M3: Uh, hours on end really.

I: Hours and hours and hours. And what did you stop doing because you were doing Facebook?

M3: Uh, various other things.

I: So, you just stopped doing that and ended up staying in?

M3: Yeah. So, like, I also realised in the end I had better things to do then just go on Facebook and look up someone's post. So, in the end I just shut it down.

I: So, has anyone had a similar experience?

F1: I hardly ever go on Facebook. I only go on, like, once a day.

I: Once a day. Just to have a little look? So, going back to some of these problems then, what's some of the problems you've had using social media?

F1: Yeah, it crashes.

I: Crashes? Okay, what happens— what does that mean if it crashes?

F1: It doesn't—

F4: Load up.

F1: Load up.

M3: In other words, you'll get a black screen for a few seconds and then it'll just pop up right back on your main menu of your computer or phone.

F1: Yeah.

I: So, is that a problem with being able to connect to the internet then, do you think?

F1: Yeah.

I: Or…

M3: I get that problem frequently with Google Chrome on my iPad.

I: So, if you're using technology outside and you can't connect to the internet, what does that mean? Is that a problem?

M1: Yes. That's normally a problem for everyone, really.

I: Why, what's the problem? What's—

F3: Because you can't get hold of anyone, or if you're talking to someone… yeah, you know what I mean?

I: What else do we use? So, you use technology to communicate with people. Why might you use technology out and about in the community? Any other reasons?

F1: If you're on Google Maps, if you're going somewhere and you need to find where that destination is.

I: And do you use it to get somewhere—

M1: Yeah, I use it. Yeah.

M3: Or, you know, you might be able to use it to report an incident.

I: Uh-huh. What kind of incident would you need to report?

M3: Um—

I: Are you talking emergency services?

M3: Yeah, accidents or a crime.

I: Uh-huh. I think that's right.

M3: Yeah. Most recently, if you're using that app for where anything terrorist-suspicious, you know, you can report it can't you?

I: Okay, so that's a way. Is it easier to use technology to do stuff, when you're out and about?

M1: It's not that easy, I don't think.

I: Do you have to learn? How did you learn?

M1: You learn by experience with much more easier technology. So you start with your phone. So, say, well, one of the Nokia phones, work phones. Then you work your way up. So, touchscreen, and then—

I: Did anybody teach you to do it? Did anyone actually sit down and show you and teach you how to use a phone or did you just do it because you practised?

F1: My mum teach me. My mum teach me to use a phone.

I: Right, okay.

F1: There wasn't, like, a touch phone, there was some tiny little Nokia ones.

I: With buttons— actual buttons on the phone? Has everyone got a smartphone?

ALL: [general agreement]

I: Everyone's got a touchscreen phone?

M2: I've got a contract.

I: You've got a contract? Your own contract? Who pays for your contract?

M2: Um.

I: Do you pay for your contract?

M2: Well, no. My mum does. So— well, my contract phone, it's got unlimited texts.

I: Okay.

M2: But you can't, you can't have, like, all the words in, like, one text, otherwise it's sent as a multi-media picture.

I: Okay, so you have to limit how you communicate with other people?

M2: Yeah. I've got unlimited texts, but not unlimited calls.

I: Excellent. I want you to have a think, then. Can you give me an example. Think about something you can do now, because you've got technology, that you couldn't do before. Can you think of something now that you're able to do which actually, without the technology, you couldn't do? Any ideas? That can be anything. So, we're talking about tellies, phones, mobile phones, Snapchat, Instagram, Facebook, a computer, a laptop. Something that you couldn't do before which now you can do.

F1: Talk to our friends on the phone.

I: Yeah, okay. So, give me an example. Who do you— don't give me their names, obviously, but do you talk to people in other countries?

F1: No.

I: Do you talk to people in other places, who don't live in this area? Yeah? You're smiling around the group. Is that because you're talking to these people here?

ALL: [laughter]

M3: Well, I— I have, um, relatives in Australia, so that could count.

I: Okay. So, you use it to communicate with relatives in other countries. What other things can you do?

M2: Play radio games?

I: Play video games. So, can we ask you an honest question? How many hours of the day do you play video games? Honestly? Okay, let's do it like this. Is it more than one hour?

M2: Yes.

I: Is it more than two hours?

M2: Yes.

I: Is it more than three hours?

M2: I think so. Three hours.

I: Three hours a day playing video games? When you're playing video games, do you play by yourself?

M2: Uh, sometimes. On GTA Online there's other players there.

I: Oh, so when you're playing online you can play with other people as well?

M2: Yeah.

I: Is it easier to play with other people when they're online?

M3: Oh, no.

M1: No. It's never easy because you can always get people, like—

M3: Who can just, you know. Hack into the game.

M1: Well, not— It's not big, major hacking. The only big, major hack on GTA was just someone putting in a dare—

M3: We encountered a similar problem earlier, didn't we? Yesterday.

M1: Yeah. Where they—

M4: When they weren't playing fair

M3: Yeah.

I: Say it again. There was a—

M4: A person interrupting the game, not being fair. Which is, like, you're trying to run it, run it when he came in, then interrupted our game together, he wasn't in our group.

I: Oh, okay.

M4: Like, reaction to it.

I: Oh, okay. So, hacking into the game, and then corrupting, changing the game.

M3: Yeah, cheating.

I: Is it easier to communicate with people [online], then it is in real life?

M1: No, not really. Because you get, like, little kids in the background when you're trying to speak to one person directly. You've always got little kids just being stupid.

M3: [[There's plenty of--]]

I: Is that people's brothers and sisters or younger people playing the game?

M1: Yeah.

I: So, you can't control who joins your group in GTA Online?

M1: [[Yah, you can't—]]

M3: [[It's a]] first world problem.

I: [laughing] It's a first world problem?

M2: Yeah, I don't like talking to people I don't know online.

I: Okay. Do you like talking— So, if you had a choice: communicate with people face-to-face, and we're talking about strangers, people you don't know. Would you rather face-to-face, e-mail, text or something like FaceTime?

M1: [[Well, if strangers--]]

F1 & F2: Face-to-face.

I: Face-to-face, face-to-face.

M2: Face-to-face, yeah.

M1: I'd probably do face-to-face, and then if it's someone I wouldn't know, I'd always check their profile first.

I: Oh, okay.

M3: Yeah, face-to-face.

I: Why not something like FaceTime then, or e-mail?

F1: Because, um, you don't know what they're going to ask you. They might ask you to do some horrible things or—

I: What kind of things might they ask you to do?

F1: Like…

I: Inappropriate things?

F1: Yes.

I: Has anyone had— has that happened to people? Have they had things happen? No. So, choosing to do it face-to-face, is that because you think it's easier, do you think that's because it's safer? Why face-to-face rather than through technology?

M3: Well, everything that you say or do on technology is in the code, it's up there even if you delete it.

I: Yeah. It's being stored. It's being saved. All your personal information's being saved.

M3: You said it yourself once, didn't you. It's all saved up in a cloud of data.

I: Yeah, absolutely. It doesn't go anywhere. When you send pictures and stuff it gets stored somewhere. Absolutely.

M3: Doing it face-to-face, you know, is much more better.

I: Okay. So, how could we— In school, could we use technology in a better way?

F1: Yes.

I: Yes. What do you think? Yes, yes. You're not sure. Maybe, maybe not. Guys over here, could we use technology— could we use more? Could we use better technology?

M3: cameras around, yeah.

I: Okay. So we're still back on maybe with some cameras. What could we do in school that we don't do at the moment that would make it better? Are you allowed to use your phones?

F3: No.

F1: No.

I: No? You're not allowed to use your phones?

F1: We are sometimes, like, if you've got free time you're allowed to.

I: So, in free time you get to use your phone? And what kind of things you doing in free time on your phones? Or should I not ask?

F1: Playing games.

I: Playing games? Playing games.

F1: I play some games and I sometimes go on Facebook.

I: Go on Facebook. Okay. So, how would you like to be able to use your phones in the school? That we're not doing at the minute but could. Is there a way that we could use them in lessons? Is there a way that we could use them in every day kind of, you know, a way?

F1: Maybe if we're stuck on a maths question, we could use our calculators.

I: Oh, that's a good idea. Would you use calculators for maths outside the school? If you had to work out what, I don't know—

F1: Yeah, I do.

I: You do? Give me an example of here you'd use maths, where you'd use your calculator.

F3: Me, I'm just [unintelligible] going shopping. We don't know how many happy sweets we'll buy which we can't do without a calculator

I: Working out how much money you've got and how many sweets you can get for your money. Excellent work. How else might you use technology? So, that's a good one isn't it? Being able to count. What about— say as an example you wanted to find out who the president of Zimbabwe was. How would you find out?

F4: Google.

F1: Google.

All: [Google]

I: You'd Google it.

M1: Yeah.

M3: Uh, just to look up for references, facts and trivia.

I: references, facts and trivia. I like it. How do you know then— So, say for example you go to Google and you Google 'where is China,' and it says 'China is **XXXX**.' What would you think?

ALL: [hesitancy]

F1: No.

F2: Not true.

M1: No, because that's obviously Google just playing up.

I: So, how do you know what you see on Google is real or true? There's an interesting point. How do you know?

F4: Look at Wikipedia.

ALL FEMALE: Yeah.

I: So, you'd go to a different site?

ALL: [general agreement]

I: Okay. And why— So, you go to one site and get an answer, then go to another site and get an answer, does that mean it's likely to be more true, do you think?

F4: Yeah.

I: Yeah?

ALL: [general agreement]

F1: See which is, um, what sounds right. Or see if there's any links what come up to it.

I: Okay.

F1: So, because there's some links what come up to it, so you know…

I: So, do you think what is on the internet is mostly true?

F1: Some things are, but—

F4: No, not all of it.

ALL: [not all of it]

M3: Some of it's complete hocus.

I: Right. So, how can you tell the difference? That's hard isn't it? How would you be able to tell the difference?

F1: You can't.

I: You can't?

M1: There's why, if you take life, what life puts in front of you, like. How can I put this? Like, life's experiences. So, what happened on earth might not— Is real, isn't it? So, and we haven't experienced what's happened on earth because we're just stuck in one corner of the world, aren't we? So, that would be put on the internet and we see that has happened somewhere in the world, that we don't know about, we may not think it's true but that might actually be true. So, that's the way—

I: Are you thinking about the difference between something that's been written and a video of something happening?

M1: Yeah, but, because we might not think that's true, but it's actually true because we haven't seen it. That's what I'm trying to say.

I: So, if you saw a video of something on YouTube, and it was a video of, I don't know, a monkey riding a dog, okay, with a top hat, riding a dog along the road, would you think to yourself that's pretend? Or would you think that's real?

M3: [[It's just a forged recording]]

M1: [[That's bound to be]] pretend.

I: A what— A what recording?

M3: A forged recording.

I: A forged recording?

F1: Unless, unless there's an actual dog and an actual monkey and you actually hear or see someone.

I: Okay.

F1: It might be wrong, but then you'd know. Just concentrate to see if it was— to see if it looks fake. Because the graphics might not be very good on it.

I: Okay.

ALL: [general agreement]

I: Let's ask a random question, then. What are schools for? Why have we got schools? Why do you have to go to school? Let's have a think.

F1: To help you learn and teach.

I: To help you learn and to teach? Help you learn what?

F1: About life and about maths. Everyday skills.

I: Everyday skills, life, maths, okay. What are schools for? Why do you have to come to school? Why do we—

F4: To get an education.

I: Okay. And what does the education allow you to do?

M2: Get you, like, qualifications.

I: Excellent. Okay. What else is an education? So, an education can be qualifications, what else is it?

M3: A head start to a new future?

I: A head start to a new future. Good answer.

F1: Job, too. Can get yourself a job with it—

I: Helps you to get a job. Okay. What else does school do? Let's see—

M2: Make friends?

I: Okay. It can help you to make friends, yeah, definitely.

F1: Um, to be more independent.

I: Helps you to be independent. In what way?

F1: Like, when you move out of the house or you're opening a bank card or… learning to do money—

I: So, skills that you need in life? Yeah.

F2: Learns you how to keep healthy.

I: How to be healthy. Sports, yeah.

M3: History.

I: History. So, subjects as well as skills, yeah, absolutely. Okay. What is it that makes learning exciting? If you had— what would your best lesson look like? The most exciting lesson you could ever think of. What would it be like?

F1: It's probably be boring. Because you probably wouldn't be learning anything if it was your best lesson.

I: Okay, so give me an example. What are you thinking in your head? Now, you've obviously got something in your head you're thinking about.

F1: Like, if you get to choose your own lesson, it wouldn't really be learning. Because most people's best lesson would probably be sitting down watching TV or going on YouTube or watching videos.

I: So, if your lesson was just watching videos on YouTube, do you think that's an important lesson or not very important lesson?

F1: You do learn stuff when you watch films on YouTube because you get some things what show the past or the, um, some films that actually came true and they're showing you what happened. Um, but, in a way you're just sitting in front of a TV screen. You're learning some stuff but not stuff that's more important than watching TV.

I: Okay. So, what's— let's have a think. What would your best lesson be? What would it be like? Got any ideas? You can plan the next lesson for the next hour, what would you do?

F3: Go to town.

I: Go to town. And what would you do in town?

F3: Go shopping.

I: Go shopping. So your best lesson would be shopping. When you're in town doing shopping, uh, what are you learning?

F1: Independence.

I: Hang on. Go on.

F3: Yeah, because if you're, like, going to pay for something, like, it's, like, competence innit? Like, to. Don't do it. Um, and obviously, like, make sure you've got the right change as well—

I: Okay. So, being in town, learning how to get the right money, interact with people, being confident, learning how to access those things. Or, or—

M3: Obviously, if we haven't [unintelligible]

I: Or, or, or, or, uh, history or something like that, which would be more important. Which would be more important? Going into town, using real life, uh, using money, going to the shops, buying something, or sitting down having a history lesson. Which do you think would be the most useful?

M4: History lesson.

F1: Going out—

I: You think history lesson, you think going out.

F1: Going out.

I: Going out, going out, going out.

F1: Because it gives you confidence.

I: Okay. Who thinks going into town would be— going into town, going to a shop, using the right money, having confidence speaking to people, or a history lesson in school. Which one would be the most useful for you?

MAJORITY: Town.

I: Town, town, town.

M2: Actually, I do think going out in town, it helps your confidence.

I: Okay.

M2: And also history as well. Both, yeah.

I: Okay. So if you— go on.

M3: I think they both have good benefits.

M2: Yeah, definitely.

I: They both have? Okay. Why?

M3: Well, for one, going into town, like **XXXX** said, it gives you confidence.

I: Okay, yeah.

M3: And, uh, history, you know, teaches you things that happened before that you never knew happened.

I: Okay.

M3: And you can use it for future reference in other history lessons.

I: So, what's more useful to you then? So, if you could have lessons online or lessons in a classroom, which would you prefer?

M1: Lessons online.

I: Lessons online.

M1: Yeah.

F4: No, I prefer in a classroom.

F1: In a classroom.

MAJORITY: Classroom.

I: Classroom, classroom, classroom. You think online. That's four. Two in class. Four.

M3: Classroom.

M2: Class.

I: Excellent. You chose online. Why online?

M1: Um, because you could spend, like, normal six hours and, this is probably just me being lazy but, you could spend the normal six hours online but you wouldn't have to go out. You could— out. You wouldn't have to go out, anyway.

I: Okay. So does technology allow you to learn in a different way?

M1: Yes, because you're learning – you wouldn't have to go to— because in normal classes, um, if you was a mainstream school student you'd have to walk around school and that, for me, would be— when I was there it was really confusing for me. Whilst, if you were a mainstream student and you just had a tablet, with a— with a, whatever, teacher on it, you'd just have to click on the apps. So you'd have a science teacher in one place, a maths teacher in one place. You'd have all those teachers in one place. So you wouldn't have to go anywhere in the school.

F1: But then you're not getting the independence or [[the help.]]

F3: [[Or the]] GCSEs.

F1: Or the help you need, and you're not really interacting with other people then, because you're sitting inside.

M3: And cooperation has gone right out the window.

I: Okay. So, do you think technology can help the learning process? Can technology help you to learn in new ways or different ways?

F1: Yes, sometimes. It can sometimes help.

M3: You can use it for—

I: What might it depend on? Sorry, go on.

F1: Um, like, like, you could either be sitting down talking to people on text or you could be out actually spending time with the people you're talking to, and, like, on text, someone could pretend to be someone else.

I: Yes, okay.

F1: And if you're actually talking to people face-to-face, then you know who you're talking to, but, like, not all the time you know who you're talking to.

I: Yes, okay.

F1: So, it kind of depends.

M3: Yeah, and it's better to, you know, cooperate and be together with other people rather than being isolated for a long amount of time.

I: So, can technology make you feel isolated, do you think?

M3: It can do, yeah. If it's just you on a computer twenty-four hours a day, not talking to people.

I: Okay. Has anyone else found that? Or do you find something different? Do you think technology allows you to communicate with more people than you normally would?

M1: Um, yeah.

I: Yeah?

M1: Um, yeah.

F1 & 4: No.

I: No?

F1: I communicate more in school than on—

I: Do you communicate in different ways using technology?

F1: Yeah.

I: Yes? What's the kind of different ways you might talk to somebody that you wouldn't normally do in person?

F1: Texting.

I: Texting people. What are the problems with texting people?

M3: Autocorrect.

I: [laughing] Autocorrect. Autocorrect changes your words.

M3: Using one word and then as soon as you send that message and it's sent—

I: You realise that it's changed the word to something else.

M3: Yes, and it has led to arguments and friends, you know, just—

I: Okay. There can be challenges, by sending words.

M3: Yeah.

I: You said about spelling. What's the problem with spelling in sending texts?

F1: You spell something wrong.

I: Yeah, there's that, and—has it ever got you into trouble?

F1: No. It's just, like, when you talk to someone you can just say the word but when you're texting, sometimes spellchecker doesn't work so you have to think of the word, go on the internet, find the word, and then you need to remember to put it back in.

I: Yeah. It could [[take a lot longer]]—

M4: [[For— for example]], my, um, there's a problem with, um, well, autocorrect. For example, when I was texting [name], he's a big fan of James Bond and he says to me when, like, he's watching some James Bond for example, for example *Tomorrow Never Dies* or something like that, and then, um, I said, 'Oh, cool, Tomorrow Will Never Dies is an okay film,' and instead of my text saying 'dies,' it says 'does'. Comes out 'does'.

I: Tomorrow Never Does.

M4: Yeah.

I: Tomorrow Never Does.

M3: Never—

M4: Yeah. Another funny incident is, with me, um, uh, a friend said, you know, remember to say thank you to everyone and, but the message came up as 'day everyone'.

I: Day everyone.

M4: [laughing] Yes.

I: Day everyone! Excellent. Okay.

M4: It was just a weird one.

I: You said about getting into arguments online.

M4: Yeah.

I: Why do you think people get into arguments when they're communicating online?

M4: That was another reason for me to, well that was just more fuel to add to the fire for me to just shut down Facebook of mine.

I: Has anyone got into arguments with people online?

F4: Yeah.

I: Yeah? What did you do about it?

F4: Um.

F1: Just ignore the person.

F4: Yeah.

F2: Yeah.

I: So, technology what or how can technology change what you do? So, in real life, if someone's annoying you, what would you do?

F1: Just walk away from them.

I: Walk away.

F1: But, with a phone, on texting, you can't because it keeps on coming up on your phone. But then you could just block them or turn the sound down.

I: So what kind of reasons might people get to— Is it misunderstandings online?

F4: Yeah.

F1: Yeah.

M1: Yeah.

I: Is that because maybe, because it's been written down rather than spoken?

M3: Yeah.

I: Anyone got any examples of that— any kind of? I was just thinking, if I was really cross with somebody, you'd be able to tell, wouldn't you, from my face that I was angry, but if I wrote it down and sent it to you, you might not know.

M1: Yeah.

F1: Like, if someone's angry, when they're speaking to someone, they would, they would— their faces, but when they're angry on text they would text in all capital letters.

ALL: [laughter]

I: So that's how you know someone's cross with you. Has anyone ever had a misunderstandings online? You've sent something and someone's completely misunderstood what you were talking about?

F2: Yes.

M3: Yes.

ALL: [general agreement]

I: [laughing]. Yeah. That's quite a lot of you. Give me an example.

M1: I don't know.

I: Hang on [unintelligible]. Go on.

F1: I can't remember. It happened ages ago.

I: Anyone got an example of a misunderstanding? Go on.

F2: Um, I texted, it was kind of like a joke, and um, I can't exactly remember what the joke was, um, and she took it completely the wrong way and she got very moody with me, and—

I: Do you understand her for doing that? Do you understand why she misunderstood?

F3: No.

F2: I kind of did, but , like, I kind of put laughing faces or, like, like, big smiles at the end of it just to say, like, it was a joke, but I don't think she still quite got it.

I: So, is that like— so were you using emojis? Does that make sense? So, if you write something, if you put a smiley face at the end that means it's a joke?

M4: It's all good.

ALL FEMALE: [disagreement]

F1: No, you would put a crying, laughing face for a joke. But you'd just put a smiley face it's like—

I: So are there certain kinds of face? So, what about— so what does a laughing, smiley— what, a crying, laughing face—

F1: Like, a crying, laughing face—

I: Which means?

F1: It's a joke.

ALL FEMALES: [general agreement]

F4: It's funny, yeah.

M3: Yes.

I: So, are there special— how do you know how to do these? So, what about a face with a sad face if it's upside down it means the thing's just sad?

F1: Yeah.

ALL FEMALES: [general agreement]

I: So, if I wrote 'I hate you,' and then put a smiley face at the end, what does that mean?

M1: Oh, it's all good.

M2: It's just a joke.

ALL: [laughter]

I: It's a joke?

M2: It's just a joke, innit.

F1: Or, if you put 'I hate you,' and then an angry face, you know they're angry.

I: Okay. So what if I put 'I love you,' and a sad face?

M2: That's still a joke.

F1: You love them, but you're sad.

F3: Yeah.

F1: Isn't that, like…

I: So, how do you know how to do this? How do you know which is the right emoji to stick on the words?

M1: We're teenagers.

F1: You try.

I: [laughing] We're teenagers. We're teenagers and we just know. How do you know? How do you know which one to do?

F3: Well, the emojis, they're pretty, like, easy—

F1: Easy to understand.

M3: Yeah. Each one tells a different expression about how someone, or you are feeling.

I: Could you have a communication— could you have a conversation just in emojis?

F1: Yeah, you can.

M1: Yeah, you could.

ALL: [agreement]

F4: We've done that, haven't we?

I: You've had conversations in full emojis? Did you understand each other?

F1 & F4: [hesitant] Yeah.

F1: You had to look at— you had to think of what it is you mean and then its fun in the end, but it's actually quite fun.

I: Have you ever found— So you've sent pictures or messages to somebody else who's completely misunderstood, like your mum or an older person? Do you think people get it, people understand?

ALL: [hesitant disagreement]

M1: No. I don't know if we ever had because people , like us, just don't normally do that sort of thing.

F1: No.

I: So is there a difference— the kinds of ways— the ways that you'd send a message and communicate is different to the how you communicate in real life, isn't it?

F1: Yes.

I: You don't show each other pictures and smiley faces in real life? You don't walk up to each other and say 'hahaha LOL'.

ALL: [laughter]

I: It's different, isn't it? So, how do you know things like LOL or— How do you know? How do you know what they're for? How do you know what they mean? Who knows what LOL means?

ALL: Laugh out loud.

I: Laugh out loud. So, what's the difference between LOL and a smiley face, or a crying smiley face? Ooh, everyone's gone silent.

F1: Um, talking. You talk by LOL, but when you just send emojis, it's like, faces—

M3: It's a way of explaining your facial expression.

F1: Yeah.

I: So, do you find sometimes, if you write in words, do you sometimes write text on paper? Do you sometimes write R or U or LOL when you're writing things down?

F4: Yeah.

F1: I don't know.

I: Because sometimes you see— because if you write, you know, 'Hello, how are you,' I've seen people write, sort of, 'Hello, how R,' with the letter R and U, is it difficult to use both?

F1: No.

M3: No.

F1: I WUUT – What you up to?

F4: Yeah.

I: WUUT?

F1: Yeah, it's like a short way to spell 'what you up to?'

I: Because 'you' doesn't even start with a U, it starts with a Y, doesn't it? So, do you think— So, would you like to see us let you use emojis and text talk in school? Would you like to be able to write a letter using text talk, would you like to use your—

F1: It wouldn't be very formal. If you—

F2: No, I don't think—

M3: It just wouldn't feel the same, really.

F1: No, it wouldn't.

I: It wouldn't feel the same?

M3: No.

I: You said it wouldn't be as formal. So, learning is formal, do you think? Being at school—

F1: You need to concentrate. You don't want to be sending, like, emojis, because when you grow up you might start thinking that you can send emojis in a formal letter, and then—

I: So, do you think there's a definite— So, using text needs one sort of skills—

F1: Yes.

I: But when you're using real life, when you're talking, communicating, with other people and writing letters and stuff, it needs to be different?

F4: Yes.

I: Why do you think that's important?

F1: because they'd get the wrong idea about you trying when you're going to get a job, the person can see you put emojis on the end of it or LOL and they might think, ooh, not a very good candidate.

I: So, who would send their application form to an employer and put at the bottom a smiley face and LOL?

F1: No.

F4: No.

F2: No.

I: Why not?

M3: No, because then that'll just give you a bad impression on you.

I: So, none of you would do it? You would never do that?

M1: Well, it really does depend, like, the people— There's loads and loads and loads and loads of people out there that really wouldn't want you to do it, but there's other people out there, okay, yes, it's informal, but, say if you got the job— say you're formal to start with, then further on down the line your boss is, like, one of those young people that are really fun and likes a joke, so, and you sent an e-mail saying 'I'd like a couple of days off,' such and such, smiley face.

I: And you think that would be okay, once you got to know them?

M1 & F1: Yeah.

I: Okay. So, do you think there's different kinds of skills we need? Skills we need in school and skills we need out of school?

M1: Yes.

M3: You just need to know how the person's going to react to the moment.

I: So how will you know how they're going to react?

M3: Well, if you know them well enough, I guess.

I: Okay. So, think about this. If you're saying that there are skills you need for school and skills you need out of school, what kind of skills do you need— How do we do learning in school? How— I was hoping you'd be able to answer that. How do you learn in school?

F2: In the classroom.

I: What happens in the classroom? Do you just walk into the classroom and suddenly you've got it all? No?

F4: No.

F1: You talk. You learn. You, like, find out new things you never knew.

I: And how do you find out things you never knew? Where do you get that from?

F1 & F4: Teacher.

I: Teacher. Anything else?

M1: Or someone in a higher place.

I: Someone in a higher place, what, on the roof?

M1: [laughing] No, no, no, no. In a higher rank, in a higher rank, like, um—

F1: Whiteboard.

I: God?

F1: Whiteboard.

I: I thought you said God.

All: [laughter]

I: God, he popped into my lesson, taught me some things, and he popped out. On the whiteboard, okay.

F1: Computers.

I: Computers. You learn on the computers. Those are the kind of skills you're using for learning in a school. So, you're talking about teachers, it coming from another person. What about from each other? Do you learn from each other?

ALL: [general agreement]

I: Are— go on.

M1: We all have different experiences, don't we? So—

I: Okay. Do you think sharing those experiences helps?

ALL: [general agreement]

I: How does it help?

M1: It helps—

I: What might it help you to do that you couldn't do before?

M1: It probably helps with life, life's experiences, so someone else might have a different life experience that you might not have.

I: Okay, so you could share that?

M1: Yeah, you could share that with other people. So, that's what I'm saying by a higher place, someone might have much more higher experience, so then they— when you go up to their rank, they pass their knowledge down to you.

I: Okay. I like that idea. So, that's the kind of skills you said you need to be in schools for. What kind of skills do you need to learn when you're not in school? What things might you learn outside of school that are important for you?

F1: Daily life.

I: Daily life. Tell me about daily life.

F1: Bills. Learning how to pay taxes and being a parent.

M3: How to handle bank accounts.

I: Handle bank accounts. Be a parent. Pay the bills.

F1: Get a job. Working seven days a week.

I: So how do you learn those skills outside of school?

F1: Um. Teachers help you prepare for it.

I: So, what happens in school can help you prepare for what happens outside.

F1: And your parents can help too.

M3: Yeah. You could, um, see how they deal with it and then learn from them.

F1: Yeah.

I: Okay. Any other ways you can learn outside the school? Have you ever learnt something outside of school?

F4: My dad, because he's really clever and he—

I: Okay, so your dad's taught you things.

F4: Yeah.

I: Has anybody else ever learnt something outside the school? Or does all your learning only happen in the school?

F2: I've learnt stuff outside the school.

I: What did you learn?

F2: Um.

I: Can you think of one example of something you've learnt outside of school?

F2: Well, I already knew how to do this, but my mum, yesterday she let me fill the car with fuel.

I: Okay. That's good.

F2: And even though I knew how to do it, but mum still, like, showed me how to do it. I think, like, I wasn't quite sure if I was doing the cap on, like, to get the fuel off right.

I: Excellent.

F2: And, um, mum showed me how to do it because, like, I didn't know that you had to wait until it makes, like, a horrible click sound to make sure it's locked. I didn't know that.

I: Exciting. Excellent.

M3: I learned how to shoot a rifle once or twice.

I: Learned how to shoot a rifle. How did you learn how to shoot a rifle?

M3: Uh, when I was eleven I, uh, my mother took me down to a, um, sports area and they had like a little shooting gallery.

I: Okay.

M3: With the, uh, rifles that shoot the small metal pellets.

I: Okay. Oh, excellent. What a good example. Superb. My last question, and then we'll stop, is how does technology let you learn? How can you learn with technology? Has anyone got examples of a way that technology has helped them to learn something?

M3: Wikipedia.

I: Tell me what kind of things you might be able to learn on Wikipedia.

M3: History, geography, um—

M1: Things about people, so—

I: So, how do you know it's true from Wikipedia? If you went to a Wikipedia page for me and it said Graeme is seven inches tall and purple. Would you think it was true?

M3: Probably.

I: Excellent. Even though you can see me now and see that I'm not two inches tall and purple?

M3: Oh, sorry.

I: [laughing]

M3: No.

I: Okay, so Wikipedia is one way, absolutely. How else might you learn using technology?

F1: Um—

I: It's not a trick question.

F1: With, like, any problems you see on TV. Like, this kid was talking to a stranger on the internet and then they met up and then she disappeared, or he disappeared. You learn from watching that, you know, you don't meet up with, if a stranger texts you, you don't meet up with them, but people still do it and every time a person does it, more people learn about it and learn you shouldn't do that, or—

I: So, technology helps you to be safe or learn how to be safe, or makes you more aware. How else does technology help you to learn? Has technology ever helped you to learn?

M1: Yes. It has.

F1: Spelling, too.

M1: Yeah.

I: Spellings? It helps you with spellings. Yes. How does it help you with spellings? What might you do to help you with spellings?

F3: It helps my little brother with his phonics.

I: Helps him with his phonics. What does it do? I mean, which bit of technology are we talking about?

F3: Like, iPads and, um, he goes on YouTube to search up phonics, and um, he's saying words now.

I: So, it helps him? So, he wasn't speaking before but using the phonics online has helped him to speak?

F3: Yeah.

I: Oh, that's good isn't it? Any other ways? Can you think of a way that any kind of technology has ever helped you to learn something?

M1: The news.

I: The news? What kind of news are we talking about? A newspaper? The TV? The news channel?

M1: You could—Any sort of news. You get news from the TV, news from, uh, a tablet—

I: How does it help you to learn, the news?

M1: Um.

F4: It tells you about what's going on in the world.

I: Yeah, and how is that helpful?

M1: It helps, it—

F4: Um, because you want to know what's going on.

M1: Yeah.

F4: Like, so you're aware, because if you're not aware, then [[you can't—]]

M1: [[You can't really]] deal with life's [[changes, can you?]]

F4: [[Yeah.]]

M2: It could affect your future—

ALL: [general agreement]

I: So, being aware. Having an awareness of what's going on in the world helps you to learn, and you can do that through technology.

M1: Yeah.

I: Any other ideas or examples?

M3: Apps.

I: Apps. Tell me about an app that's helped you to learn something.

M4: There's apps what you can sign up for and then there's maths and there's English.

I: Okay. So, special— So, apps that are about school subjects, like maths or English or science. Do they help you to learn more than you'd learn in the science lesson? Or in a different way, or not? Do you think it helps you to learn in a different way, or not? Don't know? Not sure? Okeydokes. Perfect. Is there anything else anyone wants to say about technology before we go? Anything you haven't said that you think's quite important for us to say, or not? I shall go round the group. Yes, no? No. Anything else? No. No. No. Maybe.

M1: Maybe. I'm not—Can you come back to me. I'm trying to think.

I: Yes. Anything else?

M2: Trying to think.

I: Okay. Anything else? Anything that you think's important to say?

M3: My mind's been spoken.

I: Your mind has been spoken. I like it. Right, last chance then—

M1: I can't. No. Can't think of anything.

M4: Um. Changed my mind now. I just can't be bothered.

I: Brilliant. Okay. Thank you very much.

- **END** -

Focus Group Two- Transcript Anonymised.

TRANSCRIPT GROUP TWO

I: Right, starting off, how many of you have technology of your own? So a phone, and iPad, a PC, a laptop? Let's have a look. One, two, three, four, five, six, seven, eight. All eight of you. So, how many of you have got a phone? A smartphone of your own?

M1: Yeah, I have.

I: One, two— everybody. So, all eight. How many people have got a tablet, or a Kindle? Something like that? One, two, three, four, five, six, seven of you. Who has access to a PC or a laptop? Right, one, two, three, four, five. Okay. What— how do you use technology? What are you using technology for? What's technology being used for? **XXXX**, what do you use it for?

F1: Um, your work in school.

I: Work in school. Do you use it out of school?

F1: Yes.

I: What do you use it for out of school?

F1: Um, going on BBC iPlayer, and…

I: iPlayer. And what do you do on iPlayer?

F1: Um, I catch up on episodes of things that I've missed.

I: Oh, so, okay. So, for entertainment?

F1: Yeah.

I: Yeah? How else are computers being used? Let's have a look. Yeah.

M1: Doing your homework.

I: Doing your homework. Okay. Tell me about doing your homework online. What do you do?

M1: I use either Microsoft Word or PowerPoint.

I: Okay. To do the tasks?

M1: Yeah.

I: Can you do the tasks in another way, or have they been set to have to do them with a computer? Like, would you use pencils, pens or would you prefer to do it on a computer.

M1: I'd prefer to do it on the computer.

I: Why would you prefer a computer?

M1: More relaxed.

I: Because it feels more relaxed. Okay. **XXXX**, what did you say?

M2: Gaming.

I: Tell me about gaming, because I'm old and I don't know about gaming.

M3: Oh, you're not that old.

I: What does that mean? I'm not that old [laughing].

M2: Well, PC gaming is just like a massive— PC gaming just came first, before consoles, so it's been around for years.

I: So, you're sitting in your room on your own playing a game. Is that the idea? Is that what's happening?

ALL: [general agreement]

M3: Yeah, but it's more fun.

I: It's more fun. What is it that's fun about it?

M3: You can sweat out a lot easier.

I: Say it again.

M3: You can sweat out a lot easier.

I: Sweat out?

M3: Yeah.

F2: What?

I: What does that mean?

M2: I can explain it because I used to be a PC gamer [[so I can explain it]] better.

M1: [[You are a PC gamer.]]

I: Okay.

M2: Compare a console to a PC. With a PC you can change the way the game looks, the quality and textures and details.

I: Okay.

M2: You can— it's pretty easy to upgrade in terms of, like, getting new CPUs and GPUs for a really good gaming experience on a PC.

I: Okay. So, why that over meeting somebody in real life and playing a game like, I don't know, Monopoly or cards or—

M2: Because it's addictive, really.

I: Okay. Are you— are you connected to each other when you're playing? Do you play against other people? Do you play against—

M2: You can go online competitively.

I: So what—tell me about that. How does that work, when you play online competitively?

M2: Basically, you just have, like, you either have a wired or wireless internet on your laptop or your PC, and then you can just, like, connect online to whatever game you're playing.

I: Okay.

M2: And then just playing different players from around the world.

I: So, thinking about things that are connecting people, how do you connect with people using technology?

M4: Well, the internet. Talk to them through the internet.

I: In what ways?

M4: You can go to a chat room and use Skype or Discord or something.

I: Okay.

M4: Or you could play against them on a game if it's multi-player functionality

I: And that gives you the opportunity to communicate and—

M2: You have microphones and stuff like that.

M1: Yeah, you can chat.

I: How often then, out of interest, how many people communicate with other people using technology? Like, I guess that could be text, that could be text, e-mail, Skype, FaceTime.

What's that? One, two, three, four, five, six, seven, eight, nine. Nine. Okay. What— is it useful?

M1: Uh, yeah.

M3: Yeah.

I: Yeah? Why is it useful to be able to do that?

M5: You've got people all over— you've got friends and family that could live on the other side of the world.

I: Yeah.

M5: And stuff like Skype will help you, you know, not having to spend loads of money just to go and see them. Because you can just do it with a Skype call.

I: So, cost.

M5: Yeah, cost.

I: It's cheaper. It's easier. Okay. What other benefits of communicating online?

M6: Dating sites.

I: Quick dating site. Okay. It's quick. It's quick, compared to—

M3: Actually having to find a person [[and talk to them]].

I: Okay, so [[physically—]] place— it's easier to do it online. I guess if you send a message online, if the person isn't ready to receive it then the message is still gone and they get it later.

M3: Yeah.

I: But if you're trying to give a message in person to somebody, you have to follow them round until you find them to give the message, you can't just drop the message off somewhere for them. Okay. Dating sites. Tell me, go on.

M6: I've not signed up for any, all right? I'm just saying—

I: What— Do you think the idea of dating sites is a useful one online, rather than doing it in real life?

M6: I think it's just as useful as meeting someone in person. Thing is, you could not just go around your local area and just knock on people's houses until you find someone that you like, that's your age and has your similar interests.

I: You'd probably get arrested if you started to do that, I think.

M6: Yeah, exactly. You'd probably get reported and stuff.

I: Yeah, that's true. And it gives you a way then of doing something that you couldn't do before. Because [[you're right, if you started knocking on everyone's door in Keynsham and saying—]]

M6: [[It gives you a massive choice of variety.]]

I: A massive— It gives you a massive choice and variety.

M1: That is true. That is true.

I: Okay.

M1: [laughing] [[Variety.]]

M6: [[You—]] Besides, before any of that, you would probably have to find someone that was in your school or lived near you.

I: Uh-huh.

M6: Instead, going, like, online dating you can just, like, live a bit more far away from you in, like, in an area that you'd never actually think of [[looking at]].

I: [[Yep. I think]] that's a good idea. Okay. Think about— who has access to the internet? Everyone has access to the internet in this group?

ALL: [general agreement]

I: Have you all got access to the internet?

M6: And viruses.

I: And what? And viruses? Oh dear. Um—

M4: You don't have access to the internet?

M5: No.

I: You do at school.

M5: Yeah. Well, I used to before this place doesn't have any Wi-Fi.

I: Yeah. It's not working as well. It— it's getting better, but it's still not great, is it?

M5: I do have Wi-Fi at home.

M4: You have Wi-Fi here, it's just—

I: Let's have a look then, guys. So, tell me, how—

M4: How many bars?

I: It's probably a strange question, how do you use the internet? What benefit is it? Give me an example of how you might use having access to the internet.

M6: **XXXX**, would you like to begin with yours?

M3: Research?

I: Okay so—

M1: What's that supposed to mean?

I: I thought the conversation was going to move to porn very, very quickly, and clearly it has.

ALL: [laughter]

I: Right, right. So, let's have the conversation. **XXXX**, you're now dribbling. Listen. Let's take it as a given that the internet can be used to access porn. Let's leave that one there. Okay. Right. Thank you. Think of a way— How else are people using the internet. In what ways do we use the internet? **XXXX**, any ideas? How do young people use the internet? Can you think of a way that we're using it?

M2: For research.

I: What kind of research might somebody do? This doesn't have to be you necessarily. It's about, sort of, people that you know or things that you know. How might it be used for research?

M2: Um. You could go onto Google and, uh, type a question in and then there's other websites that might give you the answer.

I: Okay. Do you think that the information on the internet is always the truth?

ALL: No.

I: How would you be able to work out if it was true or not? There's a question. Go on.

M2: Like, if you found it on more than one website—

I: Okay.

M3: Cross reference it with other things.

I: Okay. Cross reference is with other things. Such as?

M3: Other sites.

MI: Other sites. So, looking at more than one site and seeing if there's a similarity or cross-reference? Okay.

M5: At the top bar where all the URL stuff is, if it doesn't have, like an HTTP link or, like, a WWW dot, I wouldn't really say it's official. I guess it's just like another pop-up. Like, fake information.

I: Okay. Other examples of how people use the internet?

M5: Well, actually, I think most people our age actually use the internet for mostly entertainment purposes.

I: Yes.

M4: YouTube

M5: Yeah, exactly. YouTube. We always use it for YouTube because we subscribe to channels on YouTube and those people that have got their channels, every time you subscribe to them, they get money. So, people like us, just constantly watch videos.

I: Why?

M5: Because it's a video. It's entertaining.

I: Entertainment, okay. Thinking about learning then. Do you— do you do learning? Do you learn anything outside of school?

M4: Yeah.

ALL: [hesitant agreement]

I: Any examples? What kind of things might you learn outside the school? So I'm guessing— is the only way that you learn is inside this classroom? Or do you learn in other ways? Say again?

M4: Booking train tickets.

I: Booking train tickets, okay. Life skills. How else do you learn? Do you not learn anything outside of school? All your learning only takes place here and when you leave school you stop learning? Is that right?

F1: No, like, when you take the bus everywhere.

I: Okay. For getting around.

F1: For getting around. You can do that outside of school.

I: Yeah, okay.

F1: You're not allowed to take the bus everywhere?

M1: No.

I: So, could you use the technology— could you use any kind of technology outside of school to take part in learning?

M1: Yes.

F1: Yes.

M2: Yes.

I: Like what?

M5: I've used stuff like Google Maps to get places. That's pretty useful.

I: Can you use a real map? A paper map?

M5: Yeah. Well, I consider them to be quite outdated.

I: Right, okay. Yeah. How else might you use technology outside of school to learn?

M2: Um, Google stuff you don't know.

I: Can you give me an example?

M2: If you don't know something, you Google it.

I: Give me— So, what— Give me an example of something you might search for.

M2: Uh.

I: How to make a—?

M2: Yeah. How to make something.

I: Okay.

TA: What did we do—

M4: [[A paper aeroplane—]]

M1: [[How not to burn a chocolate brownie—]]

I: How to make a paper aeroplane. How not to burn a chocolate brownie. Absolutely, okay.

TA: Didn't you look up the meaning of some words?

M1: How to make a cake.

I: How to make a cake. Okay. So say you wanted to learn how to make a leek and potato soup, for an example. What would be the first thing— So, you don't know how to do it. What would be the first thing you do? Would you go to a cookery book, to the library, to the bookshop, or would you go to the computer or phone or—

M2: Google.

I: Google, you said?

M1: It depends, like—

M5: You're going to Google because, really, you don't have to scroll through hundreds of books for a start, and, second of all, usually some information can be quite a lot more simple and basic, especially on the website, rather than the book.

I: Okay. So, the learning that you're doing outside of school, is it different to the learning you do inside of school?

F1: Yes.

M3: Yes.

I: Okay. How is it different?

M2: Well, it's not [[unintelligible]] for one thing.

I: Which one isn't useful? Stuff in school?

M2: Outside the school.

I: Outside the school. It's not useful. Why is it not useful? ……Why would you say it's not useful?

F2: We kind of do our own thing.

I: What do you— So, when you're outside of school you do your own thing.

F2: Yeah, like, all your free time that you get and you don't learn as much.

I: So, you don't learn in that free time?

F2: No, you don't, because we're mainly at home or we're out and about.

I: Okay. Okay.

F2: And we don't learn as much as we— as we do in school.

M1: Well, you are learning all the time.

I: Do you think that you are learning all the time? **XXXX**, I'm going to go back to your question then. Is—what is a school for? What is the purpose of a school?

M2: Um, to teach people things.

I: Okay. Let's go a bit deeper than that. Teach people things. What kind of things do you get taught in school?

M2: Skills for life.

I: Skills for life. So those things that you learn in school are separate from what you do outside of school, or connected?

M2: Uh, can [[be connected.]]

M1: [[Separate probably.]]

I: They're separate? So, the skills you learn for life in school are separate to the kinds of skills you need when you go out of school? Or are they the same? I don't know.

M1: Um, depends on the subject.

I: Depends on the subject. Give me an example.

M1: Let's say if you— I don't know, like, food.

I: Yes.

M1: You need that for outside so that you can make your own breakfast, lunch—

I: Okay. So, cooking, being independent, learning to look after yourself. Yes. Is that something that happens in the school and outside of school?

M1: Yes.

I: Okay.

M5: Schools, like— It is completely connected in different, in all different ways.

I: Okay.

M5: On how to handle yourself in the future. Like, how to, like, if you didn't go to school, you probably wouldn't know how to cook when you're older. You probably wouldn't know how to manage money, how to get a job.

I: Okay. And those are the kind of skills that you think you can pick up in school and then use them outside the school?

M5: Yeah, exactly. Just, really, you learn almost everything that's intended, useful and needed from school.

I: So let's have the conversation then about technology use in school. Because that's always an interesting conversation.

M2: Yeah, I love to hack.

I: Say again?

M2: I love to hack.

I: You love to hack. What does that mean?

M4: It's at the school.

M5: Don't ask.

I: So, tell me, in using technology in the school, is technology used in a good way at school?

M5: No.

I: What do you mean, no?

M1: [[Because you can't use it—]]

M5: [[I know—]] I know certain people in this classroom that love playing games.

I: [[Okay, so it's used—]]

F1: [[We can't access]] any sites.

I: You can't access any sites?

F1: No. Not, well— we can't really access game sites because most of it's filtered. Same with YouTube. We can't access that.

I: Do you think not being able to access certain sites means you're not learning as well as you could?

ALL: Yes.

I: Okay.

M6: For example—

F1: Everything's filtered.

I: Okay.

M6: There's been a few lessons where the teacher's trying to show us something on the computer and what she was trying to show us was filtered, so we had to do something else for that lesson.

I: The lesson had to change because the technology let you down. Okay. What were you going to say?

M2: I think my biggest problem, for me, is how many, like, every year, how many sites get filtered on the entire, like, school network.

I: Why is there a filter on the network?

M2: It's usually filtering the system for the number of occasional reasons, like, like, rude language in, like, rude language or very disturbing or sexual images. Like, even, like, you know, stuff, like, leisure websites. Stuff like leisure websites are for, like, gyms and swimming pools. They block content like that because you might, because you might find a picture of a girl in, like, a swimming suit.

I: Okay, right. So, would you like to see the internet without a filter on it?

M1: Yes. Because they put we're post 16, so can be safe on the internet.

I: Okay.

M4: Even card games are filtered as well.

I: Card games are filtered. Okay. Think about— say again? Hang on a second.

M1: Obviously YouTube [unintelligible].

I: Okay. You'd like to see YouTube not be filtered?

M1: Yeah. So I can go on there and—

I: Okay.

F1: It's about our own safety, innit?

I: Well it is about safety, you're right. It is absolutely about safety. Go on.

M3: Uh, **XXXX**, every morning I put the Wi-Fi box on, I get a video on, turn the Wi-Fi box off and the Wi-Fi safety on, turn it off, but when I turn it back on, the video's still there.

I: does it still play?

M3: It does still play.

I: Does that mean in school or at home?

M3: Well, at home, but if you cab go anywhere—

I: But you might— Yeah, you might not have— One, you might not have filters on at home, and some video sites will download the video to a local site so it stays on your computer and it plays from there, rather than playing from its original location.

M3: Yeah, that's why I keep playing it all the way to school.

I: Well, there you go, so you can do something outside of school that you can't do in. Can anybody give me an example of a way that technology has let them do something that they weren't able to do before? Or technology has taught them something or allowed them to do something new that they couldn't do beforehand?

M5: Um, probably a really weird one, but weird pop-ups that I get taught me how people actually do get paid, like, £350 a day for just working online.

M1: No they don't.

M2: No they don't, those are cons.

M5: Yeah, that's what I used to think.

M2: Look it up on Google.

I: Okay, so the potential then— So, pop-ups have taught you that there are other opportunities.

M2: [mimicking] Six out of twelve millionaires don't want you to know , they're so angry this secret got out.

F1: They've got, like, pop-up of—

I: Okay, **XXXX**, can you give me an example of something that technology has let you do that you couldn't do before?

M1: Uh, streaming music.

I: Streaming music, yes. Of what value to you is being able to stream music?

M1: A love of music.

I: A love of music. So, it allows you to access something that you love?

M5: DJ.

M3: Ten steps—

I: DJ, okay. **XXXX** what were you going to say?

M6: Well, I have a bit of a problem…..

I: Guys, let's all make sure we're listening when people are talking.

M6: When I get home every night—

I: Hang on a second. Guys, listen. Listen everyone. If we're all sharing a conversation, we need to be listening as well, all right? Go on.

M6: My mum keeps telling me do one thing. I have iPad and television both on. Mum says I can't watch both of them at the same time.

I: Why do you think your mum says that?

M6: Because I can't watch both of them at the same time if I'm playing on an iPad or watching TV.

I: Do you think you can do both?

M6: Yeah, I can.

I: Who else—Out of interest, who regularly uses more than one piece of technology at the same time? So the telly, and the phone, and iPad or a computer or—

M5: Anybody who has their hands up, you should be ashamed of yourselves.

I: Right, that's one, two, three, four, five, six—

M5: You should be ashamed of yourselves, all of you.

I: Six. Is it easy to do more than one thing and the same time? Because some people have found this hard.

M5: Yeah. It's a woman's job.

I: It's a woman's job. We're going to have to go there. What is a woman's job?

M5: Multitask.

I: So multitasking can't be done by a man, yet one, two, three, four men around the group are saying they can do this? Okay, let's see. **XXXX** give me an example of the kind of technology you might use at the same time quite happily.

M1: Uh, playing PlayStation and also watching videos on iPad.

I: Okay. Do you think that's a skill there that you can use in life, to be able to multitask?

M1: Uh, probably not, no.

I: [laughing] Okay.

F1: I usually have my music on on the speaker, connected to my phone, and I play on my iPad as well.

I: So, two things at the same time.

F1: Yeah.

I: **XXXX** examples?

M2: Uh, probably go on the Xbox and watch a video on YouTube.

I: So, Xbox and YouTube. So, you're watching a film whilst on the Xbox as well?

M2: Yeah.

M5: When you've got four eyes.

I: Wow, there you go. So you don't think it's possible? You find that hard to understand?

M5: Well, the problem is, what's the point? If you're putting all this brainpower and focus on two things at once. It's just not good for your eyes.

I: Not good for your eyes.

F1: I also listen to music—

M4: Who's looking at both screens at once—

M2: Yeah, it's not like I can literally stretch my eyes out a different way each.

I: Let's think then. So, clearly you are very good at using technology. How could technology be used better in school? What could we do as a school to make technology much more available or useful? Because, at the minute, it's more like you're saying you find it quite frustrating. How could we better use it as a school?

M1: Get a better Wi-Fi signal.

I: There you go. A stronger Wi-Fi signal. Okay, yeah. A better download speed, somebody said. How else could we use technology in your learning?

M2: Education.

I: Like?

M4: Yes, my [[education and learning are the same thing]].

F1: [[Uh, so, like, unfilter, like,]] education sites so you can access them.

I: So, unfiltering more sites so you can get better access.

F2: Yeah.

I: Okay.

M4: Like, sometimes in lessons, even though it's good to look at the screen and look at all these words and sentences telling you about something, sometimes a video can sometimes be a bit more precise.

I: Okay. What would you find more interesting, someone speaking to you or a video about it?

M5: Like, an interactive programme, maybe?

I: Interactive programme. Would that be more useful to your learning, do you think?

M5: It seems a more realistic approach. I think it seems a bit more realistic.

I: Do you? So, out of interest, if you had to make a choice of doing an interview, for example, for a job via Skype or FaceTime, or doing it in person, who would choose Skype or FaceTime over in person?

M2: I would probably use FaceTime.

I: So, one for FaceTime.

M1: Depends on the job.

I: Depends on the job. Give me an example.

M1: Like, so say if I want to get a job in, like, another country, then I'd do it on Skype.

I: Rather than, obviously, fly to another country. So, for ease and convenience, okay.

M6: But there's one thing on YouTube you should do.

I: What?

M6: Don't watch anything that will make you have nightmares.

I: That is very good advice. That is very good advice.

M1: Like horror films.

I: Right, guys. Let's sit and think.

M6: [whispering] like *Alien.*

I: Why do you use the internet? It's a strange question, but why? Solely entertainment, or mostly entertainment?

M5: Do you really want to know?

I: Not how, why?

M5: Why?

I: Why?

M5: Why? Because—

M1: Because he can't get any himself.

M5: At this age, the internet is basically a drug at this age.

I: Okay.

M5: And, what people do is, they love to text their friends and not really be social because they just want to find an easier way to keep in contact with people.

I: and does the technology allow you to get in contact and communicate with people in easier ways than in real life?

F2: Yeah.

ALL: [general agreement]

I: Yeah?

F2: You can just text them, saying—

I: What kinds of things— How are you communicating with people, out of interest? What kind of way? Text, Facebook—

F2: Social media.

I: Social media, WhatsApp—

M3: Instagram.

I: Instagram. Okay. Can anyone give me examples of problems they've ever had using technology to communicate with other people?

M5: Ooh, too many.

I: Okay, let's have a couple. **XXXX** first, and then—

F2: Um, so someone really bad messaged me and some friends that I've had—

I: Okay, so receiving messages from people—

F2: Like, a lot of stuff trying to get into people's problems, which is not good.

I: So, do you think that technology can help to sort out people's problems? If you communicate via technology, does that help sometimes?

F2: No, no, no, no, no, because even if you delete something it may still be on there even though.

I: Okay, so the internet— Okay. Uh, **XXXX** and then **XXXX**, all right.

M5: So, this was like a, this was something old that happened back in my old school in XXXXX

I: Yeah.

M5: I was in year eight and this guy was actually, like, talking trash to me, saying he would beat me up.

I: Right, okay. Did you know this person?

M5: It was very threatening. He was actually on Facebook.

I: Yeah.

M5: And then— His name was Dylan. And then, the next day, I actually saw him, um—

M1: Oh, God.

M5: He crapped his pants, basically, when he saw me.

ALL: [laughter]

M3: He crapped his pants.

I: So, guys—

M2: Did he really? Are you just—

I: I think it's a literal [unintelligible]. Try not to get too distracted by that.

M5: He made a big mistake.

I: I think, so—

M1: What did you do to him back?

M6: Did you get the boys round?

ALL: [laughing]

I: Right, thank you **XXXX**. **XXXX**, hush.

M6: Did you show him what for?

I: **XXXX —**

ALL: [laughter]

I: Okay. Right, guys, guys, guys. Listen. So, what did— Did technology— So, he used technology in a way that he wasn't able to back up in real life.

M5: Yeah, exactly.

M1: You sure it wasn't the other way around?

M5: No.

M1: Okay.

M1: Right, **XXXX**, you had an example, go on. A challenge. Right, guys, if you can, think of a way that technology has been a problem using technology. Think about the problems you might face using technology.

M3: Basically, a problem with technology is, it's not about different— It depends on how you use it. Different type of person. If you're not a very strong person outside, and you're pretty techie, then you might be able to use technology to hurt other peoples, whereas you couldn't do it in real life.

I: Okay. So, it gives you an option that sometimes isn't available to you in real life?

M3: Yeah.

I: I was thinking about an example— Think about— Sometimes, particularly— We've got quite a lot of people at XXXXX who have autism, are autistic, and sometimes that can mean communicating with other people can be difficult.

F1: What, like socialising, like?

I: Socialising, communicating, can be a challenge in real life. Has anyone ever found it— Do people find it easier to use technology to communicate sometimes?

M5: Yeah.

M1: Yeah.

F1: I'll, like, try and socialise. Event though I'm autistic, I still actually try and socialise, but I find it a bit difficult, but I like to try and socialise with people, not using my phone constantly.

I: Why?

F1: Um, because you— um, I'd just rather talk to— Like, talking to— I like to talk to people in real life, I don't like to text constantly.

I: Okay.

F1: It's better that way.

I: Okay. Has anyone got a different idea or a different approach? **XXXX**?

M6: Well, um, it's about technology. It's okay. Um, I have four. About mum, dad, **XXXX** and **XXXX** of course. Or, like, ever. And, uh, nothing goes wrong with it except you pull a lot of faces, you know when you're sending a picture of a face?

F1: Emojis?

I: Okay. Okay, we'll go to have this example then. We'll come back and talk about emojis in a minute. Go on then.

M4: Thing is, is that, I've never really had a problem— the way I see it is that most people don't really have a problem talking to each other, because they're not talking in person, and when you're having a text message it's not like a real-time conversation— It's not exactly a real time conversation. You can actually choose when to end and start the conversation.

I: Okay.

M4: And also, when you're texting somebody else, you can take as much time as you need to reply back. Because I'm not standing right in front of you and I'm not thinking about what I need to say. I'm not being rushed to do it.

I: Great answer.

M4: So, in a text message, I can just choose when I want to respond.

F2: Gives you time to think.

M4: Yeah, exactly.

I: Okay, so, going back to the conversation about emojis. Emojis and text language.

M4: Is that a poop emoji over there?

I: How do you know what they mean?

M3: They don't. They don't mean anything.

I: They don't mean anything? Okay. They're stupid? [laughing] Okay. Why stupid?

M3: People just send pictures instead of words.

I: It's not to your taste?

M3: I don't like it.

I: It's not to your taste. Can I ask you why you don't like it? Do you know why you don't like it?

M3: Because it's a dumbing down of our entire language.

I: It's like a dumbing down of your language. Okay.

M3: It's the worst thing that anyone's ever done, ever.

I: Turning language into faces? Okay. Go on.

F1: You can tell by the faces on them what the expressions are.

I: Can everyone?

F1: Some of them—A few of them are a bit, um, a bit rude in a way.

I: Okay.

F1: Like, um, there's ones with, like, middle fingers and stuff like that. So, there is some that are a bit rude.

I: Would you use those?

F1: Um, no, I've never used them.

I: Would you use your middle finger to somebody in real life who annoyed you?

F1: No.

I: No, okay.

F1: I would like— I usually send, like, all the smiley ones. Like, I'll say all 'Hi' or send, like smiley ones and stuff like that.

I: Okay.

F1: But some of them are— are a bit rude on there.

I: Do you think— If you were to— If I had some now and I showed you them, do you think you'd all say exactly the same face? So, if I showed you one of the emojis, would you all tell me what it meant and it would be exactly the same or would it be different?

M3: Do you know that the cherry means?

M2: It might be—

M1: Do you know the eggplant—

M3: Do you know what the cherry emoji means?

I: What?

M3: It means a bottom.

ALL: [laughter]

M3: Yeah, the cherry emoji means—

M1: What about the eggplant?

TA: So how are you supposed to know that? Yeah, what's the eggplant mean?

F2: Oh yeah, I've heard of that one.

M4: He doesn't know what the eggplant means.

I: **XXXX**, do you know what the eggplant means?

M4: No.

I: No. So, why might you need to send a coded message about a bottom via a text, would be my question?

M1: Parents are watching.

I: So, it gives you ways to communicate without your parents watching? That means there's an acknowledgement that older people don't understand it?

ALL: [strong agreement]

F2: Yeah, like, they don't [[understand it—]]

M3: [[I like your cherries.]]

I: I like your— thank you, right.

M2: Why are you sending eggplants?

M3: [laughing] I like your plants.

I: Okay. Guys, hang on a second, let's—

F2: I just don't think older people know what they are exactly. What emojis are and what they mean.

I: Okay, think about, then— Think about the kinds of skills you're developing. Are the skills you develop in school— Can the skills you develop in school be used outside of school? Can you give me an example of anything that you'd learn here and use it for the rest of your life?

M4: English.

I: And how do you learn English best? If I was to teach you in the best way, how would you learn it? Conversation, book, teacher, the internet, and interactive programme? [counting responses] The internet, maybe a book, maybe the internet. Okay.

M4: Maybe, okay, you get a book and you stream a movie about the book, and you compare them.

I: Okay, comparing— So, using a traditional resource and a more contemporary resource, or a more modern resource. Would you expect to find any difference?

M1: Yes. There are always differences between the book and the movie.

I: The resources.

F1: I've read a book—

I: Hang on a second, let **XXXX** finish then we'll come here, go on.

M4: Well, I don't know. I'm not sure what you're asking. The difference between the book and the movie is kind of the point of the lesson.

I: What I'm trying to ask is, what would you learn from that process?

M4: Well, it's like, comparing a book to a movie and seeing how they're different and using that to, like, enhance your English skills.

I: Okay. Yeah. No, that's fine, it wasn't a trick question, it was more about, sort of, what would be the value of doing it, from your example. Right, **XXXX**.

F1: Well, I was watching *Twilight*, so I got the *Twilight* book and I've got the *Twilight* films, and I was watching each of them , and they're all, like, different— they're all different— each time, obviously, that there was the same character and the same person in it, but they were acting differently in a book as to—

I: Okay. There was a difference between—

F2: The movie's different to the book.

I: Artistic license, I think it's called, isn't it?

F2: The movie's much different to the book.

M4: The movies go in a completely different direction to the books. I don't know why.

I: Okay. Let me ask a couple of questions. [[Last couple of questions.]]

M4: [[*The Hunger Games*, the actual *Hunger Games*]]. *The Hunger Games* wasn't even that good.

M2: No.

I: Let's have a think about learning. Last little question about learning. If you could describe your best lesson, the most exciting lesson, what would it look like? What would be an ideal lesson for you?

M2: Gaming.

I: Gaming all of the time? Do you think you can learn from gaming?

M1: Yes.

M2: Yeah, there's a school in America, like, uses a Portal 2 as an educational aid.

I: Okay.

M3: Oh, yeah.

M2: They play through Portal 2 and they learn [[stuff.]]

M1: [[Skills.]]

I: Do you think that's a valuable way to learn?

M3: [[Actually,]] [[yes, because—]]

M2: [[Well, that's—]][[that's special awareness,]] and, like, how to adapt to things, like, things that you're not used to.

I: Okay. So, encountering new things, things that you're not used to. Okay.

M5: I can tell you what Portal is, it's made by a very—

M2: Yeah, we know what Portal is, we just—

M5: No, I can tell him because I'm good at this. A gaming company called Valve made a game called—

M2: It's a game where you have a portal gun, where you make, like, gateways to one place and another, and you solve puzzles with it.

I: Okay.

M5: Even though it uses the word gun, it's not actually violent. It just creates a new [[blue portal to a an orange portal]]—

I: [[Okay,]] let me ask you this question, then. If we introduced Portal as an option in education, what is it that you would learn from it, that you can use in your life? Other than the gaming in the classroom, how does it relate to outside? Say it again?

M3: Problem solving.

M2: Yeah, problem solving.

I: Okay, how else?

M2: Well, it, like, trains you in the way puzzles usually do, and, like, if you get into new and unfamiliar things, like, portal guns, obviously, are going to be unfamiliar, because it's impossible, but, uh, yeah.

I: Okay. French lesson or portal lesson?

M2: Portal lesson, God.

M3: When am I ever going to go to France? Why would I ever—?

I: Okay. Okay. Okay. How else? What would your best lesson look like, **XXXX**? Your most ideal lesson in the school? You can choose how it starts, what the middle's like and how it ends. What would happen?

M1: Um.

I: Not sure? Okay. What about for the lessons you've got currently? How could you make them better? Any ideas?

F2: Add music to it.

I: Add music to it. What would adding music to it do?

M1: Depends on the music.

I: Well, there was a school very recently that the school council decided to play music at break time outside. They put a big PA and played music out into the playground and out into the—

M1: Yeah. That might actually be a good idea.

ALL: [general agreement]

F1: A lot of people just like listening to music.

F2: Yeah, because then, people can dance

M5: but what if it was the] modern music that kids here like, and that's all terrible.

I: Okay. So, it would depend on what it is that you're listening to. Okay. Um—

M6: What about Kiss?

I: Some Kiss?

M6: If they had that there, they'd play Kiss. I hate that.

I: Okay. Okay guys, let's move this— Right.

M2: They're just the worst, worst music—

I: Hold on, don't start until **XXXX** has finished. Okay.

M2: Over and over again, that's all they play.

I: Thank you, **XXXX**. Okay.

F2: My ideal lesson that I like doing is, like, cooking. Because I like to experience new things.

I: Okay. So, trying out new things. So, that would be your ideal lesson? **XXXX**, what would your ideal lesson be? The best lesson in the world if you could choose. You come in on a Monday Morning, what would it be?

F1: Sport.

I: Sport. So, something physical? A very, very practical, physical lesson. Okay. Is there anything about technology that I haven't asked you that I should have done, do you think? We were talking before about problems people have had online. We talked about, do people understand text messages when they come through? We were talking about emojis, difficult to understand, kind of communication—Right, **XXXX**, then **XXXX** Go on.

M2: Well, IT is, like, very lacking. Because I know very little about computers and, like, files and stuff or, like, how to run programmes and download programmes. And, like, **XXXX**, he knows how to do that, but, like, he learned that himself, and, like, that's the kind of thing we should be teaching here, like, how to run programmes and get things to work that you download off the internet if they don't do it automatically.

I: Okay, so process— The right processes?

M2: Yes.

I: Okay, what—

M2: That's the thing. We don't learn, like, IT. We just learn how to use Word and PowerPoint over and over again.

I: What value, for you—

M2: Once you know how to use PowerPoint, you know how to use PowerPoint. You don't need to do much more lessons making PowerPoints.

I: What value would those new skills have for you, in your life?

M2: Well, working with computers. We're using computers more and more and more, so knowing how to work them and , like, get things working and not have to call the IT guy every time something goes remotely wrong would be very useful.

I: Okay. Okay. Brill. What a great answer. **XXXX**.

M5: I think the main thing, really, could be, like, coding, really. Teaching people how to use coding.

I: What value does coding have in your everyday life?

M5: In everyday life it just, like, it teaches you how to, like, like, develop commands and different animations. It's a bit like—

M2: Like, how to programme things. How to make web programmes and, like, use them.

I: Okay.

M4: It's a bit like that programme that we use. What is it? Pic— Pixel, something?

M1: Yeah.

M4: What's that thing used—

F1: Oh!

M4: Pic—

M1: Pixel, yeah.

F1: Oh, yeah. Pixelart.

M4: Yeah, Pixelart. Because we, we, like, you know, playing around with things and we like to be creative with technology, with our designs, using certain software, and that's where coding can give you infinite choice to design and create and use any kind of animation you want.

I: Okay.

M4: You can create big projects using coding. I mean, all these new games that you've got out there, that's all because of coding.

M5: Yes, you can make computer programmes with coding.

I: Okay. What makes learning enjoyable?

M3: Well, it's kind of a misnomer.

I: Why?

M3: I don't know what misnomer means.

I: A misnomer means, it's about having more than one option.

M3: That's not the word I wanted.

I: Are you talking like a red herring, or something like that?

M5: Opening multiple tabs?

I: So, what makes learning fun?

M3: It's kind of a trick question?

I: No? No, okay. Start with— Let's break the question down into two parts. Is learning— Can learning be fun?

F2: Yes, it can in a way.

M2: Sometimes.

I: Sometimes. Good.

M1: It depends. [[If you have to learn—]]

I: [[Okay, so]] sometimes. If it is fun, what is it that would make it fun?

M3: Well, like, being engaged in what you're learning about, being interested in the subject you're being told.

I: Okay.

M3: Basically, that.

I: We're going back to an earlier comment. When you said about, obviously, French, that for you, for it to be valuable, you'd need to be able to think that you're going to be able to use it onwards, and if you don't ever go to France, [[then you could—]]

M3: [[I don't really care about]] learning France— French.

I: Okay. So, is it about being able to see how it applies onwards, like—

F1: Yeah.

M3: For some people, sure.

I: Okay. Okay. What makes learning fun? That was my question.

F2: Being, like, being really, you know, creative and stuff. Like, being really creative in your learning and, like, using your imagination.

I: Okay. Any other examples?

M2: What was the question?

I: What makes learning exciting?

M4: That varies for the individual

M1: Well, I think it's the fact that it's different, really. Like, for years, before computers, we all used to use books and stuff.

M4: Yeah.

M1: So, before computers, we all had books, and it took us so long to find answers—

M4: Yeah. We had to go through all the pages.

M1: Yeah, thousands of pages.

M4: Then you had to write down things.

M1: But what makes learning exciting now, is stuff like, for example, Audible dot com. Stuff where we can, stuff where, if we struggle to see when reading books, you need all sorts of different glasses to try and read, or maybe you just don't like reading in general.

I: Okay.

M1: It's—

I: So, let's think about those skills, then. It's thinking about those skills: reading, writing, spelling, maths. Does technology make those things easier for you?

M4: Oh, yeah.

I: Yeah? Can you give me an example?

M4: [unintelligible] Spellcheck and, like, writing. Your handwriting doesn't matter now, you just, you can type it.

I: Okay. Is that preferable?

M3: there are stylus on your iPads and stuff. You can just, like, write on an iPad. Instead of, like, writing with a pen and paper, some people find it more fun to use technology to use their handwriting.

I: Okay. Does anyone— So who identified with finding spelling hard? Who find spelling's a little bit difficult? Yeah? One, two, three, four, five, six, seven. Does technology do something that makes that an easier process now, then having to have a pencil and pen?

F1: Yes. Because you couldn't— When I use my laptop for my stuff, like, my new iPad, then I can just— I can just look up the word I'm looking for, because sometimes I keep on forgetting how to spell 'important' or something like, if I want to text to my mum or something, and I can't remember what to say, then I— then I go onto my laptop, go onto my Google, spell it out and then it comes up as the— as the things.

I: So, you try to spell it in the way you think it is and it guesses [[and tells you what the word is?]]

F1: [[It guesses]] and then I can spell it on to my [[laptop]].

I: [[How else—]] How else then, thank you, how else does technology help you with things like spelling, maths, writing, handwriting?

M2: I use Siri.

M1: Yeah.

I: You use Siri. So, you use voice— So, you speak to your computer instead?

M1: Yeah, that's easier.

I: So, what do you use Siri for? What kind of things might it help you to do?

M1: Um. Uh, It tells you what, uh. I use Siri quite a lot when I'm kind of stuck, or I'm lost, I tell Siri, like, I say 'Oh, Siri, where am I?' and that tells you where you are. Um, it kind of tells you, um, where the nearest food is.

I: So, if you're out and about you can use it to find out what's going on?

M1: Yeah, so— It'll track your location.

F1: not all the time it can't

I: It can track your location. What do you think about being tracked?

M3: For me, um, I think, what's helped me learn about it, about that kind of stuff, not just Siri, because that's by Apple, stuff like Google Voice planning, Google Assistant, is I've actually been able to check the weather forecast without having to go on the TV. Because it's not on twenty-four seven. The weather forecast isn't on twenty-four seven.

M1: News programmes are kind of obsolete now

I: So, what about— At the risk of, you know, playing Devil's Advocate, have you got windows in your house?

M3: Yeah.

I: Could you just— What's the difference between— What do you get that's different between going outside and just looking out and seeing what the weather's like, and checking it on the phone, or checking it on the internet? What's different about that?

M3: future events.

M3: You can look at what the weather's probably going to be.

F1: It's not always right, through—

I: And that would then— You'd wear—

M4: It's mostly right, most of the time.

I: I think it's improving.

F1: Yeah, it used to be—

M4: It can be really cloudy. If you go outside, it can be really cloudy and you think it's going to rain and it's not.

I: Right, okay.

M4: And then you could go outside and it's a really lovely day, and you could, like, decide to go on a walk and then suddenly it starts raining.

F1: Yeah. The weather's not always right.

I: Okay.

F1: Sometimes it's the opposite.

I: Any other examples of how you might use technology in everyday life?

F2: Research.

I: Yeah. Yeah.

F2: Like, research, if you don't know what a thing is, you can research it—

M2: Wikipedia.

M1: SOS.

I: Sending an SOS, yes.

M2: Wikipedia.

M3: Yes, research, she's just said that.

I: Yeah.

M4: For most people, like, businesses and stuff, the most important thing out there is storing anything, really. Such as storing from videos, photos and music, and important documents. Stuff like, like, big places, like CIA and FBI buildings. It's, like, those store lots of encrypted information. People don't need to use their memory all the time to remember everything.

I: Ah, okay.

M4: Like, sometimes, I can't really always remember my phone number—

I: Okay, let's do a straw poll. At this point in time, who knows their mobile phone number? I don't want you to tell me it, but it's three people do out of all the people we have. One, to, three, four, five, six, seven, either, nine, [[ten, eleven people.]]

M2: [[Not off the top of my head.]]

I: Okay. Who knows their home phone number?

M1: Um.

F1: Definitely.

F2: I forget.

I: One, two, three, four, five, six. Who knows their postcode?

M1: All have.

M2: Yeah, you have to know your postcode.

I: Excellent

F2: I know my mum's telephone number.

I: Who knows the school's phone number? Two. Okay. Three.

M4: I've got it on my phone.

I: So, does technology let you— Does it do something that you couldn't do before? Does it give you the opportunity to not have to remember stuff?

F1: You can just look it up on your phone, can't you?

M3: OK, you don't know the school phone number without Google.

M2: That's what I use.

ALL: [general agreement]

I: Okay. You do know the school phone number without Google? Okay. Is there anything else I haven't really talked about, about technology, you think that we need to know about, to make it better?

M4: Oh, shopping.

I: Go on. Shopping?

M4: I've always wanted to do this. I've always wanted to take over your lesson—

I: Yes.

M4: Right, to teach everyone in this class the difference between shopping in store and shopping online.

I: What is the difference?

M4: I tell you what, I could really go in depth, but I think the main bit is about scams and frauds, and, you know, postage and packing things sometimes costs money.

M2: It's also really easy to over spend. Like, if you're just clicking a button.

M4: Yeah. Click and collect, that's all it takes.

M2: It's really easy to over spend when you do that. Like, if you don't, like, see how much you're buying and see the money leaving your hand. It's easier to over spend, and you usually have to pay by card, and credit cards are a scam.

I: Okay. So, do you think there's a new set of skills you need sometimes to be able to use technology safely and appropriately?

M2: Yeah, like, be wise to, like, all the things always trying to fuck you over.

M3: Passwords.

I: Using— Abusing passwords. Where do those skills come from? The new skills that you need.

M3: Memory, basically.

M2: Now you have to, now you just kind of have to learn them from, like, wherever, because it's not really taught in schools.

M5: You learn from your mistakes.

I: So, if you learnt them in schools would that be more useful ? That would help you outside of school?

F1: Yeah. [It would] Help us during the future.

I: Okay.

M5: Or you could just learn from your mistakes.

I: Well, they could be costly mistakes.

M5: Exactly, but that is another option that I wouldn't rather go through because I've gone through that lots of times.

I: Okay.

M1: They've brought on new technology.

I: Yes, go on.

M1: Amazon Echo.

F1: Oh, I've got that.

I: What does Amazon Echo do? Come on then.

M1: Um, Amazon Echo's a bit like Siri and there is a 'dot' or 'echo' She is called Alexaand you can tell it to, um, add shopping lists to your shopping list—

F1: Weather.

M1: It'll tell you the weather, the news—

I: Okay. So does that mean then, that this machine is listening to everything you say all of the time?

F1: Yes.

ALL: Yes.

I: What do you think about being listened to by a machine all the time? Where is that recording information going?

M1: yeah, that is a spying machine, I'm not getting that.

M5: Supposedly nowhere, but it's absolutely not going nowhere.

F1: You kind of, basically, you ask Alexa a question, and—

I: does that mean Alexa machine has to be listening to you always, just in case [[you call it—]]

F1: Not always.

I: How will it know that you're speaking to it?

M4: Because it's always listening, it's a spying machine.

I: I think it sounds like it must be listening in case you say 'Alexa, make me a cup of tea,' 'Alexa, clean my house,' 'Alexa—'

F1: No, no, no, no, no.

F2: You don't turn it on before you ask it what you want, it's always on listening isn't it?

F1: Yeah.

I: I think— Ooh.

F1: But my one, the one I got, you have to plug it in to make it work.

I: Okay, right

F2: And is it in all the time?

F1: No, no— um, yeah. Well, yeah. And it can—

M4: It only turns on when you say its name.

F1: Yeah. And, like—

M4: So it's always listening.

F1: If you say 'Hi Alexa' and it'll greet you—

I: So, it must be— It must be listening for you to say the words 'Alexa' and then—

F1: Yeah, but it's much better than Siri, put it that way, because—

I: What happens if you say something you don't want it to hear and it hears you?

M5: [[Oh, I tell you what—]]

M2: [[Oh, you're screwed.]]

M5: I tell you what, I'll give you an insight, right. **XXXX** was on Instagram and he was doing a live stream, and I was there, and he was cooking pizza.

M1: Yeah.

ALL: [laughing]

M5: And, and he was cooking pizza and he was using his Amazon Echo, and he said 'Okay, Alexa, fart,' and it made a fart sound.

ALL: [laughing]

M1: Yeah.

M5: It actually made a fart noise.

M3: That's amazing.

M2: and it tells jokes.

M5: Yeah, it tells jokes as well.

F2: And it tells you the weather outside what it is now.

M1: I'll show you— I'll show you a video of it.

M5: I wouldn't be surprised if that became his best friend.

I: So, why do people have Alexas? What does that Alexa do that you can't do for yourself?

M3: It's like a personal assistant. It, like, buys things for you and, like, takes notes and things.

F1: Bluetooth.

M2: You can basically— You can basically ask—

M3: You can interface with your phone, basically, and [[that sort of thing.]]

M2: [[Um, basically,]] you can ask Alexa—

M3: I'm talking.

M2: Oh, sorry.

M3: You can ask Alexa to play things as well.

I: Okay.

F1: Play music.

M2: [whispering] You never talk over anyone, do you **XXXX**?

M3 No, I don't.

I: Okay.

M1: Also, you can tell Alexa to, um, order your food and it'll go straight to, like, a restaurant and it'll order your food for you and it'll come to your house.

I: So, why is that useful, being able to do all those things? Getting some machine to do that for you instead of you doing it? Why is that useful?

F1: Quicker.

I: It's quicker.

M1: Because it gives you time to do something else.

I: Because it gives you time to do something else, okay.

F1: Plus, you don't have to go on your phone and, like, search it up and find it. If you tell Alexa, she'll tell you certain places and it'll— she'll—

I: Okay.

F1: It's much, much quicker.

I: All right.

M5: Hand up, all right, who, anybody, on your smartphone, has some sort of, like, McDonald's or Burger King app?

F2: No.

M1: I think just you.

M5: Who has, like, a food app? Who has a food app?

F1: I've got that, what, hungryhouse one.

M2: I've got Just Eat.

M5: Yeah, there's Just Eat, [unintelligible], KFC—

F1: hungryhouse.

M3: I've got a Domino's app.

M5: These are, like, these are made by the actual company and that is even easier to order food.

I: So, it makes things easier?

F1: Then going to, like, going to McDonald's and going to a drive thru and just order it.

I: So, it's even faster. Okay. Is there anything else I haven't talked about that I should?

F2: No.

M1: Hacks.

I: No?

F1: No.

I: Anything else?

F5: Cyber security?

I: Security and hacks, did you say?

M1: Yeah.

I: Okay, let's do that very quickly. Talk to me about security. How do you know you're safe? [participant sighs]. It's boring? Internet security is boring? Okay.

F1: No— It's, it's, like— Whoever hacks into the internet should be responsible for what they're doing, because every time I've known, I've— I don't personally know these people, but I know on the news that people have hacked into other people's accounts, like, Instagram and—

F2: Facebook.

F1: Facebook accounts, Snapchat accounts and all they're doing is hacking into your password and fighting into the—

I: Yes. So, why— That exists, but it doesn't exist in real life. You can't hack a person.

F2: No, you can't.

F1: No.

I: So, how do you have to change what you do to make sure that you're safe and things like that?

F2: Password.

M4: Like, get good security. That's the thing they could teach in schools. How to, like—

I: How to be secure online?

F2: Yeah.

M1: Change your password every couple of weeks.

I: So let's— Out of interest, do you not think it's strange we talked about being secure and keeping safe, but when we talked about the internet filters in school, that was a really big

issue about, ‘we shouldn’t have to do that because we’re old enough.’ So, how do we balance that out? Because, you’ve got, ‘we should be taught how to be safe and how to keep safe online,’ one of those big ways is having a filter.

M5: [[If we turned off the internet system--]]

M2: [[we should be able to get past the security filter—]]

I Okay.

M5: What if we turned off the entire firewall and then we look at what people decide to do when something unusual comes up?

I: Okay. But, so there are keyword searches. Everything you search for on a school computer goes into a system. They know what it is you’re looking at. Everything. And there’s a list of trigger words, and that e-mail goes to the IT manager.

M5: Okay.

M3: LOL

I: Yes. Particularly when you spend time trying to work out which words were on the list and which words weren’t. Which words you could look at. I remember this conversation. Go on.

M6: Um, can some people be addicted to electronics?

I: Well, there’s a great question.

F2: I what it, I think— It’s mostly going to be teenagers, innit, that are addicted to technology.

I: Why? Why is it addictive?

F2: Because it’s entertaining.

M4: Because they have the most time and experience with technology.

I: Because they have the most time and experience.

M2: That’s how our brains now work.

F2: Yeah. Because if you think of my mum—

M6: **XXXX** are you addicted to technology?

I: So, do you think that, do you think then, in ten years’ time when the Millennials, as you are called, in ten, fifteen, twenty years’ time, will be in a different situation? Will technology just be normal then?

M4: Yeah.

F2: Yeah.

I: Yeah? So there will be no such thing as— So, this won't be a conversation we'll ever be having—

M3: We're evolving really quickly, actually. We're evolving too quickly.

I: Because of technology, or—?

M3: Because there are so many people out there that just focus on technology every day, there are more companies like Microsoft and other, like, technology companies, that are just trying to evolve technology so quickly, that eventually it could just get out of hand.

I: What does out of hand mean?

M4: So, you're scared *Terminator* will happen? You're scared we'll become, like, the Sky Net will happen?

TA: Well, you never know, do you?

M3: World War Three might be because of robots.

M4: Us verses the machines.

I: Right, thank you very much. Is there anything else we need to talk about?

M2: No.

F2: No.

I: Thank you.

M1: PornHub.

I: We're not talking about PornHub

M1: Oh, okay.

I: Thank you.

END -

Teacher Questionnaires

Teacher A

Using Technology

What kinds of technology do you use?	Where do you use them?	What do you use them for?
Computer	Work & home	Internet connectivity - research, online learning - information/training webinars. Production of documents. Presentations. Storage of electronic communications and documents.
Mobile phone	Home & on the move	On the move communication with school and colleagues – email, internet access, verbal communication
Email	Home & work	Work related communications & distribution of key information. Keeping up-to-date with statutory requirements.
Texting	Home & work	Communication with parents – reminders in the main. Communication re & reporting of staff absence.
Social Networks	Work	Marketing, communication & publicity of key messages and successes

Describe how technology helps you outside of school?

- Mobile technology ensures connectivity with the school setting when I am away from the school site

- Enables me to work offsite- but I can only access stuff I have wifi, which doesn't really help all of the time. If I am expected to be contactable all of the time then I can't always do this. If you have everything at the touch of your fingers, but then you are not within wifi range then how can you access this? Storing to the cloud and using the cloud is good, but without wifi you cannot access your knowledge!

Describe how technology helps you in school?

- Is the backbone of internal and external communication
- Enables work to be presented and quickly shared in a high quality and easily accessible format
- Allows others to access work and add to it
- Provides a ready source of information and support
- Provides webhosted software for management of personal pupil and staff data, tracking of pupil progress and attainment etc.
- Management of publicity and key information sharing with parents/carers and the wider community
- - Support storage and easy access to electronic documentation

In what ways could technology be better used in learning?

- Higher focus on the teaching of keyboard skills
- - Improvements to filtering arrangements

What are the challenges of using technology?

- Limited financial resources – needing to make do with and mend aged and life expired hardware
- Internet connectivity
- Pace of change and upgrades
- Lack of time to keep up with developments
- I am worried that my students will know more about it than me!

Has technology allowed you do something that you couldn't before- give examples?

- Improved communication – use of OneNote
- Ability to collaborate in the development of projects and plans - OneNote
- Instantaneous sharing of information with the school workforce, parents/carers and the wider community – Office 365 calendar, school website, texting service, school/PTA Facebook page
- Ability to access electronic documents anytime, anywhere - OneDrive

What are the barriers that prevent you from using IT in your teaching?

I think that it is assumed you know what to do. I trained as a teacher when there was not as much IT as there is now. Young people have grown up with it and as part of their development have learned how to access, use and be confident. They know who things connect online. It is often expected that you will be on social media, know what a wiki is and how you use this in you teaching. For me, it is really a challenge. I am good at teaching but the job is no longer about you having understood the topic or subject and then you pass this to the learners through your teaching. You are expected to be multimodal and online but I think that this is hard. How can I measure or mark students' learning online? Where will I put the ticks and comments? How can I send this off?
Just because it exists, this does not mean that you should. I worry about privacy and how young people are connecting with each other and with strangers that they might be meeting. I also am concerned that young people are sharing images with others online and not knowing how and where these are being stored or by who.

Part of my role as a tutor is to provide pastoral support but the young people know more than me when it comes to technology. Students are used to expecting things quicker and being able to communicate or interact with others faster. They do not understand the postal service or recording VHS from the TV. Streaming, instant, multitasking are all assumed, but older people like me are not that au fait. I think it needs a revision of what a teacher means nowadays as the job is quite different.

Teacher B

Using Technology

What kinds of technology do you use?	Where do you use them?	What do you use them for?
Mobile Phone	Everywhere	Phone calls, social media, texting, communications basically!
iPad	Work	For taking photographs/video, testing apps, testing Wi-Fi access around school
Laptop/PC	Work and home	For email, word processing, access to servers and systems, testing servers and
MP3 player	Whilst walking/ at home	systems, testing applications, software for different jobs, internet access.
Smart TV	At home	Listening to Music, podcasts etc.
USB key/ External Hard Drive	Everywhere	Downloading and watching films, Netflix access, Internet access, watching TV, recording Live TV. Extra Storage of Data, Back-up of Data, Transporting of Data.

Describe how technology helps you outside of school?

Technology helps me outside of school by keeping me connected with the world around me. I am easily able to access what my friends are doing, keep up to date with latest news, check the weather in my area, or where I am going. I can keep a track of my diary, which is with me all of the time, update it, and share events with friends. It's useful to have everything at the click of a button when I need it.

Listening to music on the go helps me relax. Similarly being able to watch films at home through the internet, giving me access to a huge archive of films, is great for relaxing, and chilling out too!

Describe how technology helps you in school?

Technology helps me in school, because without it I would not have a job! Without Technology in school it would be a lot harder for staff and students to instantly access knowledge. If a student asks a teacher 'what does this mean?' there's no more going to the library, and letting them know tomorrow. The teacher looks it up there and then, and they have the answer. Whether this allows the answer to be as remembered, by having such instant access to it, I'm not sure. Perhaps it also makes a little lazy at retaining knowledge, because if we forget the answer is so instantly recoverable with use of a device with access to the internet.

I think technology enhances the learning experience, students can become more engaged with touch screen white boards with interactive multi-player games, than with a teacher with a chalkboard talking to the class, explaining things with non-animated, black and white scribble.

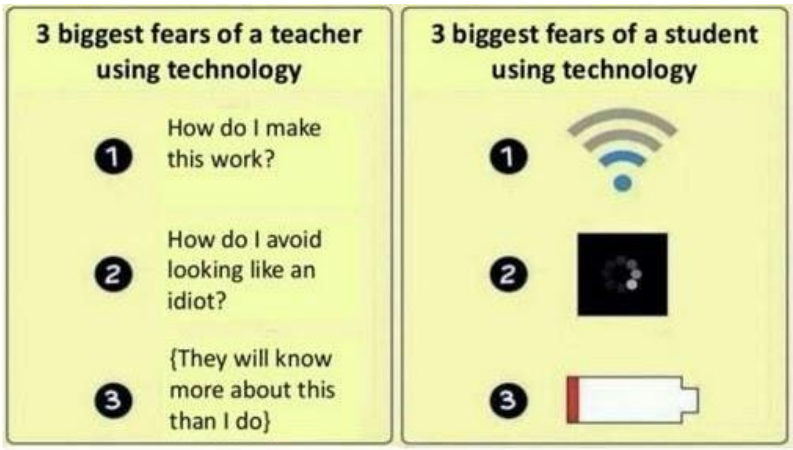
In what ways could technology be better used in learning?

Technology is not used to its fullest, there are so many things that technology can offer us, but it's having the time to explore this, when things move so quickly. Often technology can be seen as a reward, as a game, rather than as a learning tool for use within lessons, not just at free time. I think technology is becoming more and more integrated, and often schools cannot do without nowadays.

What are the challenges of using technology?

Challenges are mostly around recognising a piece of technology's full potential, having time to familiarise yourself with the way things work, and then using that before things move on, and then being stuck in this cycle having to relearn/reteach things often as technology moves on, or as an update is released. I need to be the leader in my class so really I have to practice as the group will have a much better working knowledge of technology in everyday practice, whilst in school this is still under developed. There seems to be a default to using physical resources, books, whiteboards etc rather than actually take the plunge to using ICT.

I found this picture on a course I was on and it sums up the challenges really well.



Has technology allowed you to do something that you couldn't before- give examples?

Technology has allowed us to provide staff and students with access to school files from anywhere, using a single log in. It allows students to video call other students at other schools in other countries, without costing a fortune, or having to set up lots of equipment to do so…. No more writing letters and including a photograph of the class! The school can share with parents the successes of students on the online blog, staff students and parents are able to make live comments, everyone is included, and everything is interactive.

What are the barriers that prevent you from using IT in your teaching?

I think that for me, the challenges of having to learn a new way of teaching with technology, or indeed through technology is hard. It is difficult because there are new processes required for accessing, creating and opening learning materials which do not sync with school systems and often require a new way of think. Examination bodies do not accept some formats/evidence so you must return to the old ways of relying on Word or creating paper copies for sending to the examiners. The difficulty here is that young people very rarely use paper and most qualifications such as the employability certificate require you to submit a printed CV and completed application form (in black ink/capital letters) but in real lie this would be done online. Therefore the way we are assessing learners does not really equate to their experiences and can be contradictory. This is a challenge with autistic young people for whom we know that generalisability, abstraction and transferability need to be taught rather than assumed. I remember one Functional Skills exam (which is supposed to be the most appropriate for Post 16 students as it is related to real life functionality (rather than theory etc) where the students were asked to draft, proof read and then write in best, a text message (on paper). This is odd.

I also worry that actually, the ways young people expect information quickly, or use technology to check if what you are teaching as the teaching (often as a result of a specification given by BTEC) is 'right'. This can compromise your authority as a teacher. On reflection, I'm not sure that this is a bad thing, but it means I need to change how I teach acknowledging that technology will be the most up to date. The difficulty is learning a million new ways, process, techniques and passwords. I want to use technology better in teaching, but I think that this must be a supported process and we need to be shown how and why. Otherwise we can only continue as we are with technology, which is the case currently. I'm not sure what the new way of teaching through technology is.

Teacher C

Using Technology

What kinds of technology do you use?	Where do you use them?	What do you use them for?
Ipads Laptops Onenote Outlook Class notebook Gaming consoles (xbox/wii) Prezi Sway Office Class dojo Facebook Twitter Smart notebook Microbits Scratch Kodu 2simple	In school and at home	To support learning To provide opportunities for pupils to independently access a personalised curriculum To manage and organise leadership team meetings and actions To provide inspiration and engagement To support writing To present lessons and ideas to pupils To support pupils needing the opportunity to revisit learning To communicate with parents and other outside agencies To share what the pupils are doing and celebrate their achievements To create schemes of work that can be worked on collaboratively To provide structure to the school day For coding and game development opportunities To meet curriculum coverage, ie databases
Describe how technology helps you outside of school? Technology helps me access leisure time through tv, streaming etc It enables me to access work files and emails at home and be more efficient in my approach		
Describe how technology helps you in school? Technology is an integral part of the classroom and my leadership role It enables me to manage things more effectively and ensure the pupils are able to access engaging content and related tasks		
In what ways could technology be better used in learning? People need to think carefully about how and why they are using the technology. It needs to add something within a learning framework but can too often become a holding activity. There needs to be a clear structure to how technology is used, when and why. People also need to be more willing to try new things and learn with the pupils. Most of my people expect it as an entertainment tool rather than seeing it as a learning tool, although, I am not really sure how it will help learning as it can be a distraction. It		

means that books and pens will become extinct and everything will be impersonal and on the iPad.

What are the challenges of using technology?

Things need to link up better and be more reliable. Mostly there is a work around when things don't work or a back up plan but at times the technology gets in the way of the learning and so people avoid using it. They say that technology is great when it works but usually it doesn't as it needs an update or a new password. This can be frustrating when you plan to use it but the learning stops as the technology stops play. It is always changing and moving and it can be a challenge to keep up and make sure what you are using is fit for purpose

Has technology allowed you to do something that you couldn't before- give examples?

Technology has allowed me to adapt my teaching to ensure the pupils have ownership of what they learn and when. Through using class notebook I can identify a range of learning at the pupil's individual level and prepare resources to support their acquisition of that skill. They can choose which activities they do and when and this has enabled me to meet the needs of pupils who are resistant to a direct teaching approach.

What are the barriers that prevent you from using IT in your teaching?

I think that technology just arrived very quickly and we didn't really have a chance to consider how this might work in education. The speed of which technology develops means that in only the last twenty years we can do things that were previously impossible. Like video call people, work collaboratively on the same document in real-time across thousands of miles. Being able to stream films, access a wealth of information at the touch of a button. Search through data in excess of 100millions sources in Nano-seconds. This has major changes for how we know stuff.

The information you can find out about our world and bring together a clearer picture of who you are and how you are connected (or not) to others that we could never do. There are ways of countering people's opinions and outlets to voice off and broadcast yourself which may not have been as easy previously. This brings together opportunities to connect with people that was not available before. An example of this is Twitter- the Pope has Twitter, the Royals have it, and politicians, trump and they now access members of the public. This is novel. We must learn how this applies to our teaching as you may not need to know about a person or facts about their history if you can find it out or ask them directly. The problem is that lots of school ban devices in the class as I think that teachers feel threatened in terms of their authority on the class and technology or indeed access to the internet compromises their role as the person with the knowledge (or the all-knowing)

I can as do my students, 'Google' anything and there might be a link for it (mostly yes) this might be made up or one person's perspective, research, opinion etc but the connection didn't exist so quickly or easily, The downside here is that his means young

people can access risky content that might expose them to things that are not safe or appropriate, so teachers have to put the controls about how and why you might access. The way that exams work, you need to be able to know the certain piece of information and then give it because in real life young people might Google it or use a calculator to find out, they can also do this to find out phone numbers, addresses etc. This potential means that we might not have to ever remember another thing- (although you will always need wifi).

Lastly, I think some people assume that you will just know how to use IT, but like anything we have to be taught (yes, even teachers)/ I remember going home for the summer and when I got back in September my whiteboard had been replaced with a SMART board which "would solve all my problems now". It didn't as students still wanted to write, we could not makes notes at the same time as watch a film or use the internet through the projector. It also need applications and software to work properly which the school did not pay for so it became a glorified UHP

Teacher D

Using Technology

What kinds of technology do you use?	**Where do you use them?**	**What do you use them for?**
Pc Kindle Pad Phone (not smart!)	Home and school	Shopping, research, reading books, email and other social media, accessing word programmes, preparing resources for work, taking photos, making calls, catch up tv / radio
Describe how technology helps you outside of school? Outside of work I use it for leisure, shopping, communication purposes		
Describe how technology helps you in school? In school I use it as a resource to plan, research, use things like youtube, communicate with others, keep informed, book vehicles. To make assignment booklets and worksheets. I use images form the internet,		
In what ways could technology be better used in learning? To link students with others in a more intergrated way. I have used places that allow me to put up worksheets for common access, am aware that I need to upgrade to better systems such as the one note to take this further		

What are the challenges of using technology?

When it doesn't work it's a real hassle
Keeping up with change as new things happen
Passwords
Syncing- whatever this means
Lots of new language to understand, which seems easier for young people.

Has technology allowed you to do something that you couldn't before- give examples?

I am able to relate to the students on their terms as this is their world and not mine. I think they could teach me, as the career is very different to how I started. I was teaching English which meant learn about set texts and then answers questions about them. Given the amount of information that young people have at their fingertips, it seems hardly worth it. Maybe a new curriculum is needed for English! Although, I would be cautious of using numbers for words and text message speech!

What are the barriers that prevent you from using IT in your teaching?

The way that young people assume that it is central to their learning is important as the world does not always need technology. It is ok to carry on as you were, rather than assume that because we have the internet this somehow should change the way teaching happens. I think that learning set texts can help young people to understand the wider social themes that we get through history. We are only a product of what has happened. Language and practices change, as I can remember when I taught in a school that had on TV and one PC, it was a BBC and everyone had an opportunity to access it with simple programmes. You did comprehension watching programme and then completing a worksheet for the week when it was your turn. And then the PC was used (It might have been an Acorn PC) where you typed in a programme and a character on the screen jumped up and down, of fell over. I can't really understand why? The government say that coding is important, but how this relates to real jobs I will never know. If I work in retail, or at the butchers, how will coding help~?

I think that there is a time and a place for technology and if you just accept that it happens like that out of school so it should inside then you can lose the integrity and quality of your role as a teacher. How can young people know what they find on the internet is real, particularly with all the fake news being spouted. The role of the teacher is very important, although I guess it might change a little. I think that you must teach the young people how to qualify the information they find or help them to connect it to others or make sense of it, otherwise the young people will get a confused message about their world. It is about being able to make sense of what they are exposed to and find through technology.

OneNote Responses

Name	What kinds of technology do you use?	Where do you use them?	What do you use them for?
Student A	Smartphone, tablet, TV ps4	home, school, phone out places	
Student B	tablet, ps4, tv, pc,	home, school, phone out places	for pleasure
Student C	iPad , iPhone, tv , beats solo 3 headphones wireless, amazon echo dot , ps3	on the bus , at my nans house , at home, school, at my dads house etc.	music , games social media , texting , calling , watch videos
Student D	Computer , phone, iPad	at school, home, work	music , social media, texting , calling
Student E	Phone headphones iPad	at home	

Student F	Laptop I pad		Watch videos
Student G	Phone	Home, my grandparents house, Wednesday travel, sleepovers	Texting and calling , learning about what is happening in the world
Student H	Phone, iPad, laptop	Wednesday travel, home, on the bus to school and home.	Calling, Facetime, games, texting
Student I	Computer, iPad and phone	I use my phone at home and in breaks. Computer at home. I leave my iPad at home	i use my phone for music and messaging at pc for making videos for YouTube and watching Netflix and my iPad for games.
Student J	Gaming PC	At home	Competitive gaming, Facebook games, Testing Overclocking, I can learn more than I can in school becauise the internet knows more.
Student K	computer and iPod phone DS	because there fun	playing games

Student L	iPad, iPhone, iPod	I use those at Home. And Sometimes I take my iPod to the trips.	To watch YouTube And taking Photos.
Student M	iPad phone and computer	I use them in school and home	Games and texting and phoning
Student N	iPad and phone	I use them at home.	Texting
Student O	Phone iPad headphones	On the buss and at home and at school	
Student P	Laptop, computer, iPod touch, fire kindle, phone, mp3,	Home and school, school taxi	Music, games, watching,
Student Q	Phone, tv , computer , iPad , ds	At school, home ,bus	YouTube , music , movies
Student R	iPhone, iPad, school computer & iPad,	At home, school, bus, car, on holiday, at friends house,	Music, texting, youtube, spotify, facetime, snapchat, messenger, s.n.s (social networking sites)

Name	**Describe how technology helps you out of school.**
Student A	Research and doing something in my own time
Student B	research, recreation. I use th internt to find out things that I cant have in school. The teacher only knows what it says in books and in the units,. The web is better as its updated
Student C	bus app , google, calling people if I need help, music
Student D	music, calling people , texting people
Student E	I use the voice recognition and speak in to it. I use my iPad to go
Student F	I can take pictures of things that I don't understand and ask my mum or teacher what that means instantly.
Student G	Looking things up on the Internet, social media, calling, texting
Student H	I can Facetime family and friends, look up information on Google
Student I	My phone for calling and texting and listing to music.
Student J	Testing, Messing around because it's a Chinese phone and its cheap, texting, Receiving fake messages from HSBC, Weirdest calling me with no number, YouTube
Student K	I use them on the bus sometimes.
Student L	Like to use the IPod To Telling the time.

Student M	I use them because they help me do my own things and I listen to music
Student N	I text my friends , this means I can say more than I would using my voice
Student O	Makes it easier to do my work. I can spell better and use microsoft
Student P	If I get stuck I can search it on google and find difficult words.
Student Q	Texting , to find information, for research. The TV is more of a distraction than a help.
Student R	Listen to music, keep in touch with friend, take photos, set alarms and reminders

Name	**Describe how technology helps you in school.**
Student A	Researching information and finding out bwhat I shappeniog.
Student B	Googling information, making documents, typing things out
Student C	Google for searching ,
Student D	Google for searching, bus app to get to school, we use one note to work together
Student E	Helps me to talk to my parents (text or calls),
Student F	I am more confident when using technology as speaking to people face to face is hard
Student G	Completing tasks, calling for advice/information.
Student H	Completing tasks, calling for advice/information.i can work with my friends and we work together. If we were using a poster to make then this would be hard but if we work on a onenote collabortive page then I can see what he is working on and

	then this will help me to learn and think abiout things like he s triggering my mind. If we work together on a poster I think that I don't want his help but on onenotei am happier.
Student I	It helps me to know I'm not in the 1980s, helps me to stay in touch with my friends, helps to communicate with school when out independently, helps me to stay calm with music
Student J	I am able to develop a persona, I am not confidengt in real life. Things are quicker with IT. It is the way that the world work but the school is not like this.
Student K	It lets me look at newsround, using the internet to find out about things happening around the world, listening to music, text my friends and parents,
Student L	It helps me to take photos and videos, which I then share with the class. I can text my parents. I enjoy listening to music on computers at school. I can upload videos to youtube to share
Student M	Listen to music and play games
Student N	It helps me of my learning...as my writng is bad and nonoe can read it but using a PC helps me be good. This means that I am happier working together as I wont do this with a worksheet in pairs. I refuse.
Student O	Type my work up. I use it to look up bus timetables.i can also see my bank balance when my wages get in without going to the bank. It makes people do things quicker than the oldern days were you had to be in person top do stuff. Its like a remote life.
Student P	It helps me of my learning. I can check answers and share my work quickly.
Student Q	You can use technology as a calculator to help you with maths, I can use the dictionary on the iPad. I use Wikipedia for information and history.

Student R	I like to google and read about Paul Gascoigne in the newspapers online including the daily star the sun the sun from Scotland and the lish sun. I like to do this lots to find out lots more about Paul Gascoigne.
Student S	I can text the school while I'm out independently. I use the internet to find bus timetables and recipes. I use it to calm myself down

Name.	**In what ways could technology be better used in learning?**
Student A	It could be more efficient in performance
Student B	We could learn more about computers like; how they work, how to identify and fix a problem, how to enter admin mode, what admin mode IS, and how to run tricky programs. At the moment we learn how to use programs like word and PowerPoint and sometimes scratch which is useful and all but recently my home computer has started acting up and I have know idea what to do, IT lessons that teach students how to fix things like that would be way more helpful then how to use scratch. Less how to make a PowerPoint presentation and more what to do when PowerPoint won't load
Student C	Better WIFI, better computers and iPads each, research. Let us use the computer to do exams, wen we use it it is to make word documents or powerpoints, we can use this for exams, only make paper dpcuments and print them into file.
Student D	If I feel strssed I can immediately get images of things that make me happy. I can also get reassurance from my friends and mum thorugh socila media and messenger,.
Student E	Better wifi for smart phones. Can we now do our tests on the computer but not sat in a hall doing exam papers in silence. This is not like how the world work now.

Student F	It would be good to have individual computers or iPads asi can work quicker with computer as writing is hard and the way that I like to learn means I can check things with friends and share my stuff quicker thanin a class.
Student G	It could help us understand more. In my functional skills exam I hasd the speaking and listening exam and it was a pretend speech and presentation to people. This makes me embarrassed and I did not do well. In my real life I speak to millions of people online and in face to face. Why cant I just record me talking to people in real life and then send that in, or they couls see my using skype this is still talking to people but in reality rather than pretend.
Student H	We only really yuse it to create documents or powerpoints. In life technology is central to how we do stuff rather than create documents. I can do more with technology than without.
Student I	Better wifi for my ipod to listen to ipod
Student J	Being taught how to use technology and ways for engaging with people. What does it have to do with my classroom lesson. They are different skills and I need to learn both. I can be better if someone teaches me.
Student K	To get on more websites and find more info
Student L	Better wifi, different information available in diffwerent ways, if you like video or online you can, and then if not you can do lecture or listening to video/teacher.
Student M	Use it more often to type up work and use more google. We could have an exercise app to help us keep fit
Student N	Teachers don’t know as much as google does, there is more knowledge outside the school classroom. If you ask questions about using technology or the world, sometimes the teacher does not know. We have to use the internet together to fuind out. But this means that sometimes the things are not true. But I can tell the doiffernce by checking. We are quicker leanring when the internt is used.

Student O	Better WIFI , better computers and iPads each. The computers are slow and it would be better if they took less time to load up. We could use it for taking pictures
Student P	If we have a Laptop each better Wi-Fi
Student Q	Learn how to access information on our iPad or phone so I don’t have to learn different waysm, this means I can go out of school with it and be abel to understand. I like to work with my mates on something, we can do this with an internt and computer, I cant do this with paper posters or worksheets. This meens that when we are working it is like a live project.
Name	**What are the challenges of using technology.**
Student A	You can get confused because people might not mean what they say and you wont be able to see thir faces when you talk on text
Student B	You sometimes come across information which is false and you don't know if it is or not
Student C	The internet speed is poor, the filter system is patronising & Recently the school system stopped saving my documents
Student D	WIFI, more laptops, better iPads . update means stuf moves on your pc or phone so you need new ways to do stuff. This is like life, I have autism and this means tha I don’t like changes, but leanring that this will always happen is good for me.
Student E	you cannot always know if what you read is true, so you have to check it from othe rplaces and the teacher.
Student F	not being able to connect to wifi
Student G	Not being allowed to use this in sessions

Student H	We need to be shown how the technology can be used to help us learn in all our sessions not just IT.i am using it everywhere and this is noit the same in school, the teacher makes us use IT to complete workboks and then print for portfolio. This is not the 21st century.
Student I	Sometimes teachers don't know how to use technology. This means that we rarly get proper it using, and only workbooks and worksheets wi=hcih are old fashioned.
Student J	You must answer questions using pens and paper which is old fashioned. And exams are always paperbased.
Student K	We only use technology to makes documenst which are then printed and marked.
Student L	Better internet connection .in my English exam I had to write a letter but I don't do this really. I would send an email of facetime someoine. If I want a job I can do this applying online now. The exams is not realy helping me do the stuff that I want as its old fashioned.
Student L	I know more than the teacher does with IT. They can't use collaborative tools.
Student M	You have to remember different ways of working with PC/laptoips.Ipad and phones. There are alwys passwords to remember and they are hard but it means my stuff is safe.
Student N	Ipads don't shre work with PC s well.
Student O	The WIFI doesn't always work.but you can get this everywhere now, it is in mcdonald and subway and the cafes. In the bus station it is free wifi.
Student P	I feel sad when I cant go on youtube
Student Q	I cant use my phone to find the answers to questions but in town I would if needed to know something.

Name	**Has technology allowed you to do something that you couldn't before? - give examples.**
Student A	Google translate means I can speak lots of langauge
Student B	If iam lost i can use google maps to help me get home, this happened when I got off the bus at wrong stop
Student C	You can get information in an extremely fast way
Student D	I can chat with people in different countries and share texts
Student E	I don't have to remember phone numbers anymore andd hard words are easy with google.if I need to know what something means and I am on my own, I can take pictures and ask friends to tell me or my mum. They can text me the answers.
Student F	the computer can read work and websites to me and I can listen as reading is hard
Student G	I can work in the café as the jobs I need to do are on schedule and I can watch videos to show me
Student H	I am more independent as my ipad helps me to know what I have to do next and can remidn me so I don't need to speak to teacher
Student I	I take pictures of things that helps me to rememebr , I can watch a video about how to mend my bike, thihs is better than someone tellung me as I lkike to watch it happen. But theis is always American video.
Student J	I saw XXX using his ipad to speak and he hasn't got a voice os this is good. I am only really allowed to use ipads for rewards, not for my real sessions.
Student K	In english I can find other words atht mean the same thing and use them to make the teacher please.

Student L	In onenote I can record my answer with video recorder as writing can be hard and take me a long time.
Student M	You can find friends on facebook and a girlfriend
Student N	That I can use music channels
Student O	It is quicker than going to the library as books are difficult to read but Google is quicker.
Student P	We have onenote for discussions in class if you don't want 2 speak out loud you can still give your answer and idea
Student Q	I can tell the tyeacher I don't understand and they can help me without other people knwoeing,.
Student R	Yes I can do more researching.